ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes

Chemistry

Chemical Technology

Biology

Biotechnology

Provided by

University of Science – Viet Nam National University Ho Chi Minh City

Version: 06 December 2024

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Cử nhân Hóa học	Bachelor of Science in Chemistry	ASIIN	AUN-QA 26.12.2016 - 26.12.2020	09
Cử nhân Công nghệ Kỹ thuật Hóa học	Bachelor of Science in Chemical Technology	ASIIN	–	09
Cử nhân Sinh học	Bachelor of Science in Biology	ASIIN	AUN-QA 30.12.2017 - 29.12.2022	10
Cử nhân Công nghệ Sinh học	Bachelor of Science in Biotechnology	ASIIN	AUN-QA 12.10.2019 - 11.10.2024	10
Date of the contract: 09.11.2023 **Submission of the final version of the Self-Assessment Report:** 15.12.2023 **Date of the audit:** 24.04. – 25.04.2024 **At:** University of Science – Viet Nam National University Ho Chi Minh City				
Expert panel: Prof. Dr. Angelika Loidl-Stahlhofen, Westphalian University of Applied Sciences Prof. Dr. Günter Claus, Mannheim University of Applied Sciences Prof. Dr. Meinhard Simon, Carl von Ossietzky University of Oldenburg				

[1] ASIIN Seal for degree programs

[2] TC: Technical Committee for the following subject areas: TC 09 – Chemistry; TC 10 – Life Sciences

Dr. Hoang Phan, EPOD Company, Vietnam Mạnh Nguyễn Tiến, student at Ho Chi Minh City University of Technology	
Representative of the ASIIN headquarter: Dr. Emeline Jerez	
Responsible decision-making committee: Accreditation Commission for Degree Programs	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2023 Subject-Specific-Criteria of the Technical Committee 09 – Chemistry as of 29.03.2019 and the Technical Committee 10 – Life Sciences as of 28.06.2019	

B Characteristics of the Degree Program

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
Bachelor of Science in Chemistry	Cử nhân/ B.Sc.	Chemistry Science	EQF-Level 6	Full-time	No	4 years (8 semesters)	133 – 137 credits (238-246 ECTS)	Annually, August 1954
Bachelor of Science in Chemical Technology	Cử nhân/ B.Sc.	Chemical Technology	EQF-Level 6	Full-time	No	4 years (12 trimesters)	131 credits (232-244 ECTS)	Annually, August 1954

[3] EQF = The European Qualifications Framework for Lifelong Learning

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
Bachelor of Science in Biology	Cử nhân/ B.Sc.	Life science	EQF-Level 6	Full-time	No	4 years (8 semesters)	131 credits (246.5 ECTs)	Annually, August 1972
Bachelor of Science in Biotechnology	Cử nhân/ B.Sc.	Biotechnology	EQF-Level 6	Full-time	No	4 years (8 semesters)	131 credits (246 ECTs)	Annually, August 1999

The ASIIN assessment team acknowledged and considered the contextual framework within which the Bachelor's degree programs under review are offered:

Ho Chi Minh City University of Science (HCMUS hereafter) is a member of the Vietnam National University—Ho Chi Minh City (VNUHCM), a ministerial-level university in Vietnam.

Established in 1996, HCMUS has ten faculties and two research institutes. With over 15,000 undergraduate and 1,400 graduate students, the university offers various study programs, including 22 bachelor's, 34 master's and 30 doctoral degrees, across various fields of knowledge.

HCMUS's vision is to "become a leading university in Vietnam and Southeast Asia in training and researching science, foundational technology of knowledge, and the digital economy." According to its mission statement:

> "The University of Science is a centre for research, training, development, and application of science and technology. It provides human resources and scientific and technological products to meet the socio-economic development needs of Viet Nam."

HCMUS has developed partnerships with international universities and organisations, promoting international exposure and academic exchanges. It actively engages with the local community through various outreach programs, contributing to Vietnam's development.

Through this procedure, the University seeks ASIIN accreditation for four undergraduate programs: the ***B. Sc. in Chemistry*** and ***B. Sc. in Chemical Technology,*** which are managed by the Faculty of Chemistry, and the ***B. Sc. in Biology*** and ***B. Sc. in Biotechnology***, which are operated by the Faculty of Biology and Biotechnology.

The Faculty of Chemistry

Khoa Hóa học was established in 1954 and consists of the departments of Organic Chemistry, Inorganic and Applied Chemistry, Analytical Chemistry, Physical Chemistry, Polymer Chemistry and Medicinal Chemistry. Currently, the Faculty offers undergraduate, master's, and doctoral-level study programs, and its vision is "to become a leading center of excellence in chemical training, research and science & technology transfer in Viet Nam, comparable with other prestigious chemistry education and research centers in the region and worldwide".

The Faculty has presented the following mission statement on its website.

> "The Faculty of Chemistry trains and develops learning, research, working, and adaptative skills for students in the modern world. By doing so, the Faculty provides highly-qualified human resources in the fields of education, technology and scientific knowledge transfer for local and national industrialization and modernization."

The Faculty of Chemistry presents the ***Bachelor of Science in Chemistry*** and ***Bachelor of Science in Chemical Technology*** with the following objectives and graduate's profile:

Program Objectives:

	Bachelor of Science in Chemistry	**Bachelor of Science in Chemical Technology**
O1	Students are trained with basic knowledge of mathematics and natural sciences applicable for chemistry.	Students are trained with basic knowledge of mathematics and natural sciences applicable for chemical technology
O2	Students are trained with basic and advanced knowledge of chemistry; broad and in-depth practical skills with sound methodology, competencies to learn new knowledge and skills towards applying chemistry in the knowledge based economy, and full capacity to contribute to the development of science and technology.	Students are trained with basic and advanced knowledge of chemical technology; broad and in-depth practical skills with sound methodology, competencies to learn new knowledge and skills towards applying chemical technology in the knowledge- based economy, and full capacity to contribute to the development of science and chemical technology.
O3	Students are educated to have great virtues, including a good sense of civic responsibilities in national construction and defense, a passion	Students are educated to have great virtues, including a good sense of civic responsibilities in national construction and defense, a passion for

	for science, political integrity and excellent professional qualification, self-confidence, and honesty.	science, political integrity and excellent professional qualification, self-confidence, and honesty.
O4	Students acquire independent and pro-active working skills including logical identification and resolution of problems, creativity, leadership, and competitiveness in the national and international labor markets.	Students acquire independent and pro-active working skills including logical identification and resolution of problems, creativity, leadership, and competitiveness in the national and international labor markets.
O5	The graduates to be able to have excellent English language proficiency in communication and work with a minimum level of English-B1.2 (CEFR - Common European Framework of Reference) or equivalent.	The graduates to be able to have excellent English language proficiency in communication and work. minimum level of English-B2.1 (CEFR – Common European Framework of Reference) or equivalent.

5

Career Opportunities:

'Graduates with the ***Bachelor of Science (Chemistry or Chemical Technology)*** degree can find careers in research & development, quality control, business, management, and teaching in all chemistry-related fields including chemicals, food, medicinal, environment, health, and materials. Potential employers include research institutions, quality control centers, manufacturing factories, science and technology businesses, universities, and other education institutions.'

<u>The Faculty of Biology and Biotechnology</u>

Khoa Sinh Học - Công Nghệ Sinh Học roots can be traced back to 1953, but it was formally inaugurated as the Faculty of Biology in 1976. Following a period of expansion and development, it was renamed as Faculty of Biology – Biotechnology in 2015. It comprises the departments of Molecular & Environmental Biotechnology, Plant Biotechnology & Biotransformation, Physiology & Animal Biotechnology, Plant Physiology, Ecology & Evolutionary Biology, Microbiology, Genetics, and Biochemistry. The Faculty's vision is to become, by 2025, "a strong research and education organization in the fields of biology and biotechnology in Vietnam and become comparable to other prestigious universities in the region."

The Faculty has presented its mission statement on its website:

> "The Faculty of Biology & Biotechnology (FBB) is active in undergraduate and graduate education, research and technology transfer in the fields of life sciences. We offer excellent services and products to meet the increasing demand of Vietnam's socio-economic development and global higher education."

As part of the self-assessment report, the ***Bachelor of Science in Biology*** and ***Bachelor of Science in Biotechnology*** study programs are introduced with the following objectives and graduate's profile:

Program Objectives:

	Bachelor of Science in Biology	**Bachelor of Science in Biotechnology**
O1.1	Apply basic knowledge of mathematics, natural sciences, basic social sciences, fundamental biology, and biological techniques to explore issues related to various biological fields such as biochemistry, genetics and molecular biology, microbiology, plant physiology, animal biology, ecology and biological resources	Apply mathematical, chemical, physical, social, and biological basic knowledge to advance their understanding of the major areas of biotechnology (industrial, agricultural, medical and biomaterials).
O1.2	-	Apply knowledge and techniques of Biotechnology field to solve the relevant problems.
O2	Perform basic technical operations in laboratories or work units related to biology.	Formulate, perform the experiments and analyze scientific results/data of biotechnology research.
O3	Communicate effectively in the written and oral form, including the ability to summarize, review or critique a scientific topic.	Communicate effectively in the written and oral form, including the ability to summarize, review or critique a scientific topic.
O4	Collaborate effectively as part of a team and demonstrate an ability to set goals, manage tasks, timelines, and problem- solving.	Collaborate effectively as part of a team and demonstrate problem-solving ability, planning, organizing, and managing tasks and timelines.
O5	Demonstrate an ability to communicate in English according to the general requirements at the bachelor's level of the Ministry of Education and Training	Demonstrate an ability to communicate in English according to the general requirements at the bachelor's level of the Ministry of Education and Training
O6	Demonstrate a commitment to responsibility and honesty, and awareness of professional and ethical integrity in scientific practice.	Demonstrate a commitment to responsibility and honesty, and awareness of professional, ethical, and legal integrity in the practice of biotechnology fields.

Career Opportunities:

- ***Bachelor of Science in Biology*** graduates "can find employment in various fields related to biological sciences. They can work in companies, institutions, hospitals, and other

relevant organizations. Job positions available to them include researcher, technician, quality assurance specialist, quality control staff, and more."

- ***Bachelor of Science in Biotechnology*** graduates "have diverse career options. They can pursue positions such as research and development staff, technical applications specialist, technical sales representative, and more. Their expertise in biotechnology equips them to work in industries that utilize biotechnological applications, including agriculture, pharmaceuticals, healthcare, and other relevant sectors."

C Accreditation Report for the ASIIN Seal

1. The Degree Program: Concept, content & implementation

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

Evidence:

- Self-assessment report.
- Objectives-Module-Matrices as part of the self-assessment report
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- Discussion during the audit.

Preliminary assessment and analysis of the experts

i. Learning Outcomes

At the program level, there are two tiers of development for the educational objectives of the programs under review, as elaborated in the self-assessment report and the Curriculum documents:

- Intended Program Objectives (IPOs), which are a subset of the competence profile and specify the skills and competencies that a student should possess upon successful completion of the programs (see section B).
- Intended Learning Outcomes (ILOs), which are derived from the IPOs and guide the design and assessment of the curriculum (see Appendix).

Within the provided documentation, the University presents tabular mappings of linkages between IPOs and ILOs, modules and ILOs, as well as ILOs and ASIIN-specific criteria for the four programs. **However, it has come to the audit team's attention that the IPOs and ILOs, as presented in the self-assessment report for all four programs, are not available on the respective websites. They request the university to ensure consistency in the presentation of the programs and make this relevant information available to all stakeholders.**

Aside from this, in the course of their assessment, the experts attest that the learning outcomes of the programs correspond to level 6 of the European Qualification Framework (EQF). The ILOs are developed based on each program's objectives, a process involving stakeholders, and benchmarking against pertinent national and international standards and references. The programs' ILOs align with the Vietnamese Qualification Framework 2017, the National Law of Higher Education, HCMUS's vision and mission, and the mandates of the Faculty of Chemistry and the Faculty of Biology and Biotechnology, respectively. Moreover, the experts assess that the outlined objectives suffice the ASIIN Criteria for the Accreditation of Degree Programmes. Further discussion of the curricula will follow under Criterion 1.3.

ii. Graduate Qualification Profiles

Graduates of the ***Bachelor of Science in Chemistry*** and ***Bachelor of Science in Chemical Technology*** study programs are expected to embark on diverse career paths, ranging from roles in research and development, quality control, business, management, and teaching in all chemistry-related fields, including chemicals, food, medicinal, environment, health, and materials.

Regarding those completing the ***Bachelor of Science in Biology*** study program, they are anticipated to possess skills enabling them to work as researchers, technicians, quality assurance specialists, and quality control staff, among others, in hospitals and other relevant companies/institutions. In the ***Bachelor of Science in Biotechnology*** study program, graduates are expected to contribute with their expertise as research and development staff, technical applications specialists, and technical sales representatives, to name a few, in industries utilising biotechnological applications, such as agriculture, pharmaceuticals and healthcare.

During their exchange with the program coordinators, the experts discussed the similarities between the graduate profiles of the study programs in ***Chemistry and Chemical Technology***, as well as between the study programs in ***Biology and Biotechnology***. The experts specifically inquired about the expected differences from the perspectives of employers and industries towards students from these similar programs. The program coordinators clarified that Chemical Technology emphasises practical application, with slightly fewer credits allocated to fundamental knowledge compared to Chemistry, which places a stronger emphasis on research and development. Regarding Biology and Biotechnology, the Biology program initially focused on fundamental research but adapted to incorporate specialised knowledge as new technologies emerged. Biology students often pursue broad majors, while Biotechnology leans towards applied aspects. In terms of

research, Biology students are better suited due to their focus, while Biotechnology graduates are preferred by manufacturers for their applied skills.

While discussing with the expert panel, students and alumni expressed their satisfaction with the programs under review, the learning they deliver, and future job prospects.

On their part, industry representatives equally conveyed their satisfaction with graduates, highlighting their proactive and open-minded attitude as well as willingness to learn. In particular, the industry partners confirmed their eagerness to take in students and graduates from the programs under review, citing the knowledge and technical skills they bring with them.

During the discussion with the program coordinators, the assessment team learned that for the programs in ***Chemistry and Chemical Technology***, nearly 90% of students receive offers from the industry after completing their internships. Upon graduation, 80% secure employment. Similarly, for the programs in ***Biology and Biotechnology***, there is plenty of job opportunities available for students' post-graduation, with 70 to 80% securing employment at the time of graduation. Some graduates also pursue careers as administrators in the government.

All in all, the experts gained the overall impression that the imparted qualification profiles of the programs satisfy expectations from all sides and allow the students to take up employment corresponding to their qualifications following their graduation.

iii. Review of Learning Outcomes

According to the University's self-assessment report, program educational objectives, intended learning outcomes, and curricula undergo major review every five years to remain aligned with advancements in science and technology as well as emerging trends. These reviews involve consultation with internal and external stakeholders, benchmarking processes and tracer studies. Within two years of implementation, the University may review, amend and supplement the new study program according to regulations.

When asked about their involvement in the process of reviewing the learning outcomes, alumni and industry representatives who attended the audit confirmed their contribution to the University's efforts. They expressed willingness to persist in supporting the ongoing improvement of the programs.

From the provided documentation, their exchanges during the audit, as well as the further discussion about the University's quality assurance mechanisms under Criterion 1.3 and Criterion 5 below, the experts gained the impression that appropriate, recurring review mechanisms concerning the learning outcomes of the programs under review are in place.

Criterion 1.2 Name of the degree program

Evidence:

- Self-assessment report
- University website: https://hcmus.edu.vn/
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- Curriculum documents, all programs under review
- Sample Diploma and Diploma Supplement, all programs under review
- Discussion during the audit.

Preliminary assessment and analysis of the experts:

The degree programs under review follow circular No. 24/2017/TT-BGDDT from the Minister of Education and Training (MOET), which promulgates the "Level-Four Classification of Education at the Bachelor's Degree Level".

A student who fulfils all requirements of the programs under review will be awarded the following degree:

- Bachelor of Science in Chemistry or *Cử nhân Hóa học*
- Bachelor of Science in Chemical Technology or *Cử nhân Công nghệ kỹ thuật hóa học*
- Bachelor of Science in Biology or *Cử nhân sinh học*
- Bachelor of Science in Biotechnology or *Cử nhân công nghệ sinh học*

For the ***Bachelor of Science in Chemical Technology*** program, the expert panel asked during the audit about potential discrepancies between the Vietnamese name and its English translation. The program coordinators clarified that program naming adheres to strict regulations set by the Vietnamese government, which were duly considered during both program naming and translation into English. The experts acknowledged this clarification and have no further comments on the matter.

The experts confirm that the English translation and the original Vietnamese names of the four study programs under review are appropriate and correspond to the programs' intended aims and learning outcomes.

Criterion 1.3 Curriculum

Evidence:

- Self-assessment report.
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- Curriculum documents, all programs under review
- Discussion during the audit

Preliminary assessment and analysis of the experts:

The curricula, structure, and composition of the study programs under review are presented in the University's provided "Curriculum documents", including the curriculum and study plan and module handbooks. According to the self-assessment report, the programs align with the Vietnamese Qualification Framework and the Law of Higher Education. Additionally, the ***Bachelor of Science in Chemistry*** and ***Bachelor of Science in Chemical Technology*** programs are compared with similar programs in reputable universities in Taiwan, Japan, and France. Similarly, the ***Bachelor of Science in Biology*** and ***Bachelor of Science in Biotechnology*** are benchmarked with programs in universities in New Zealand, Belgium, Taiwan, and Japan.

i. Structure of the Programs

At HCMUS, an academic year is divided into two regular semesters (two semesters/year). The duration of the programs in ***Chemistry, Biology and Biotechnology*** is 4 years or 8 semesters. However, the ***B.Sc. in Chemical Technology*** program has a study period of 4 years or 12 semesters (3 semesters/academic year, 4 months/semester). **Regarding this, the expert team believes that the definition of "12 semesters" may lead to a potential misunderstanding regarding the total duration of the program as 6 years. They suggest adopting the term "trimester".**

A regular semester consists of 18-19 weeks (15 weeks for learning and teaching, one week for midterm exams and two weeks for final exams). Students can also take classes for ten weeks in the summer semester. Students are expected to complete the study programs under review within four years. They can extend their study time if needed but no more than three academic years according to the study plan.

There are four blocks of knowledge in the Bachelor's curriculum: 1) General education courses, 2) Fundamental knowledge, 3) Professional courses, and 4) Graduation courses.

ii. Contents

The curricula of the programs under review are structured around the following content:

1. **General education courses** provide basic knowledge of natural science, social science, and humanities. Natural science courses, including general chemistry, general biology, mathematics, physics, and computer science, are distributed in the first two years. Social science courses, including political theory, physical education, and military training, spread over the four years.

2. **Fundamental knowledge courses** are designed to provide students with essential knowledge and professional skills for research and application. They are offered from the 3rd to the 8th semester.

3. **Professional courses** provide specific knowledge and skills related to a specialised area and include mandatory major-specific knowledge and elective major-specific knowledge. The specialised areas in each program are as follows:
   - ***Bachelor of Science in Chemistry:*** Specialised areas depend on the chosen program option. In the Standard Program (Option 1), students select from six majors: *Organic Chemistry, Inorganic Chemistry, Physical Chemistry, Analytical Chemistry, Polymer Chemistry, or Medical Chemistry*. For the Honours Bachelor's Program (Option 2) and the English Enhanced Bachelor's Degree Program (Option 3), recommended courses are provided. The Vietnamese-French Double Diploma Program (Option 4) mandates students to choose one of three majors: *Organic Chemistry, Inorganic Chemistry, or Polymer Chemistry.*
   - ***Bachelor of Science in Chemical Technology:*** *Organic and Medicinal Chemical Technology, Inorganic Chemical and Materials for Energy Conversion Technology, and Polymer Science and Technology.*
   - ***Bachelor of Science in Biology***: *Biochemistry, Genetics—Molecular Biology, Microbiology, Plant Physiology, Animal Biology, and Ecology—Biological Resources.*
   - ***Bachelor of Science in Biotechnology***: *Bio-industry, Bio-medical, Bio-materials, and Bio-agriculture.*

4. **Graduation courses** provide working skills and attitudes through applying knowledge to practice.
   - For the ***Bachelor of Science in Chemistry*** and ***Bachelor of Science in Chemical Technology***, these include *Internship (optional), Pre-thesis, and Thesis*.
   - For the ***Bachelor of Science in Biology*** and ***Bachelor of Science in Biotechnology,*** there are three options for the students: *Internship-based*

graduation, *Thesis-based* graduation and *Course-based* graduation (see comments about the different graduation pathways under Criterion 2).

Upon reviewing the structure and content of the curricula for the four programs under review, the experts see an opportunity for the University to apply more synergies among the different programs, such as exchanging modules between Biology and Chemistry.

Regarding the Chemistry/Chemical Technology programs, the audit team believes that the curriculum has yet to integrate modern knowledge in chemistry. Therefore, they see that the programs could be expanded to include environmental topics (Green Chemistry and Life Cycle Assessment).

Apart from this, based on the documents presented and the discussions held during the audit, the assessment team confirms that these programs are suitable to adequately prepare students for the labour market. They commend the program coordinators for their motivation and significant efforts put into the optimisation of the programs.

iii. Internship

According to the documentation, students enrolled in the ***Chemistry/Chemical Technology*** programs must fulfil the 2-3 Vietnam credit pre-graduation requirements. These entail an internship and/or a seminar or research project, along with either a 6-credit undergraduate project or a 10-credit undergraduate thesis. The internship lasts two months and is under the supervision of a designated instructor. It can take place in a research institute or industrial company, allowing students to apply their general, specific, and transferable skills in a practical setting.

In the ***Biology/Biotechnology*** programs, students who opt for an internship-based graduation intern at various settings such as factories, hospitals, companies, institutes, or research centres aligned with their chosen biological specialisation. Upon completing the internship, students are required to submit a report and take six more credit courses.

During the internship, students are supervised by a site supervisor from the industry and an academic advisor. They must report their work every two weeks and their soft skills, attitudes, and problem-solving abilities are evaluated. At the end of the internship, students prepare a report approved by the site supervisor and academic advisor before submitting it to the faculties. The student presents internship outcomes to the assigned Internship Evaluation Committee. The internship score is evaluated based on the criteria provided by the committee, the site supervisor, and the academic advisor.

During the on-site visit, the experts examined a selection of internship reports and internship evaluation forms. They also reviewed the list of agreements, MOUs, and MOAs and appreciate the internship opportunities for students.

iv. Mobility

During their discussion with the President's office representatives, the experts learned that the University is making efforts to encourage students to participate in activities abroad. However, the success of these programs depends on various factors, including students' English proficiency and access to financial support. To address this, the university is concentrating on improving the English proficiency of the students, and the teaching staff is enhancing their collaboration with international partners.

The experts commend the University for its focus on improving students' English language proficiency. **They strongly believe that HCMUS should continue to increase the English level of the student population, and this should be consistent for all study programs.**

In their discussion with the audit team, students from the four programs under review emphasised the various opportunities for international collaboration. Students from the ***Chemistry/Chemical Technology*** programs mentioned internship and exchange program opportunities with institutions in Taiwan, Japan, and Sweden. Students from the ***Biology/Biotechnology*** programs noted the opportunities for exchange with institutions in Korea, Taiwan, Japan, and the UK. They also confirmed that the teaching staff encourages them to pursue studies abroad.

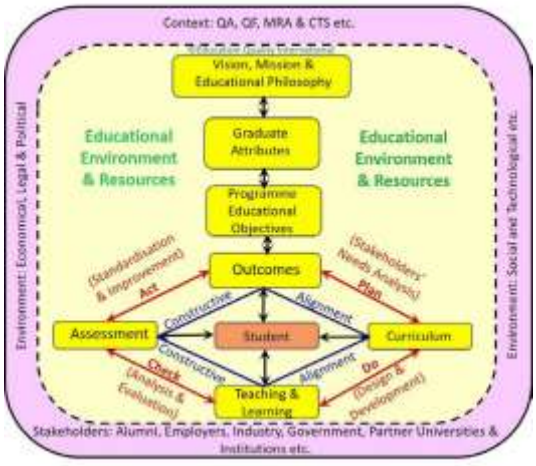
The expert group acknowledges the University's efforts in facilitating these opportunities. **However, given the relatively low level of international mobility among undergraduate students, as described during the audit, the university is encouraged to expand its student mobility programs.**

In terms of credit recognition for study performance achieved abroad, the University's "Academic Regulation on Undergraduate Level" states the equivalency process as outlined further under criterion 1.5.

v. Curriculum review

The curriculum and course syllabi are regularly reviewed, evaluated, and updated with major changes every five years as noted under Criterion 1.1. Changes are made by considering the appropriateness of current competencies, related technological developments, market demands, national laws, and stakeholders' feedback. The curriculum is developed through a series of steps, as outlined in the figure below. After

approval, updated programs, curriculum, and course/ module syllabi are announced on the respective Faculty's website.



The process of developing, reviewing, and adjusting the study program's objectives and intended learning outcomes. Source: Self-assessment report, HCMUS.

The experts acknowledge the Faculty of Chemistry's, as well as Faculty of Biology and Biotechnology's commitment to continuously improving the study programs' curriculum.

The expert group can confirm that the study programs are regularly updated with input from both internal and external stakeholders. Feedback is collected through various mediums, such as surveys of graduates, alumni, and employers, as well as consultations with academic staff. The Science and Academic Committee at the respective Faculty reviews the results of these surveys, along with consultation with experts in the field, to make recommendations to amend the curriculum. Several minutes are provided to detail these recommendations.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- University website: https://hcmus.edu.vn/
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- HCMUS Admission Website: https://tuyensinh.hcmus.edu.vn/
- REGULATION On university-level admission; college-level admission for preschool education
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

According to the Self-assessment report, admission to the programs under review is conducted once a year in August. Information about the admission procedure is available on the University's website and thus accessible to all stakeholders.

The Admission Committee consisting of the Board of Managers, Academic Affairs, and Student Affairs, is responsible for developing and announcing the enrolment criterion/requirements. The programs are introduced through enrolment counselling in high schools and on the media, including but not limited to websites, television, newspapers and brochures.

According to the self-assessment report, admission to HCMUS follows the national regulation and is based on either one of the following six admission pathways:

1. Annual National University Entrance Exam (30-50% quota): based on the scores of three subjects for which students have registered for their expected programs.
2. National University Competency Assessment Test (45-50% quota).
3. Priority for admission according to the regulations of VNUHCM: based on academic performance at 149 specialised/gifted high schools and high schools with the highest annual National University Entrance Exam average in previous years (25% quota).
4. Direct admission according to the regulations of the Ministry of Education and Training: for candidates who won the National Excellent Student Prize, the National Science and Technology Prize (4% quota).
5. Admission to Vietnamese and foreign candidates graduating from international high schools (2% quota).
6. International English certificate and high-school result (8-15% quota).

Selection from either path is made by taking the candidates with the highest scores down until the corresponding quota is filled. Most of the students at HCMUS are admitted via the first two paths (30 – 50 % quota and 45 – 50 % quota, respectively), but the quota for each scheme varies each year depending on HCMUS's intake policy.

The Vietnamese Ministry of Education and Training will organise the Annual National University Entrance Exam every summer. All high school students in Vietnam must take part in this exam. It covers several subjects, such as Mathematics, Foreign Languages, Physics, Chemistry, Literature, and History and lasts 3 - 4 days. Based on the scores on the exam and their preferences, prospective students get admitted to the different universities in Vietnam.

In addition, the two National Universities in Hanoi and Ho Chi Minh conduct their own admission exam, the so-called National University Competency Assessment Test. The National Universities have introduced this test to give high school graduates another chance to get admitted into university studies. It only lasts about 3 - 4 hours and consists of several questions and problems to assess the applicant's knowledge and skills in different subjects.

The University's Admissions Committee compiles statistics from the list of registered applicants, calculates the matriculation score according to the established standards, and announces the enrolment result in the media and on the University's admission website. When a list of accepted students is available, they will be directed through the admissions process following the University's rules.

2016 – 2022 statistical data for ***Chemistry and Chemical Technology programs*** reveals fluctuations in the number of students entering each year. For the regular Chemistry program, the admissions ranged from 126 to 352, while for Chemical Technology, they varied from 45 to 149. 2016 - 2018, data for ***Biology and Biotechnology programs*** shows that Biology intake surged to a peak of 331 in 2017 before experiencing a slight decrease. In contrast, Biotechnology witnessed a rise in admissions until 2018. The detailed numbers are shown in the table below:

Table 1: Number of Admissions. Source: Appendix Self-assessment report, HMCUS.

Year of Admission	Chemistry			Chemical Technology	Biology	Biotechnology
	Chem	Chem-Honor	Viet-French Double degree			
2016	126	10	27	45	264	173
2017	236	25	19	122	331	196
2018	267	28	47	117	310	242
2019	352	28	40	134		
2020	261	34	43	149		
2021	196	30	47	144		
2022	196	26	0	141		

The tuition fee for the programs is approximately 23.4 million VNĐ (equivalent to around 850 €) per year per student. However, for the English Enhanced Chemistry program, the tuition fee is double this amount. HCMUS is part of the national university system, so it follows national regulations in this matter.

During the discussion with the representatives of the President's office, the expert group inquired how HCMUS ensures accessibility for students from poorer families. In response, university officials emphasised the University's commitment to inclusivity. They highlighted an alumni-operated scholarship program specifically designed to assist students from underprivileged backgrounds. Additionally, flexible payment options, including instalment plans, are available to accommodate students facing financial challenges.

Students testified during the audit that they were informed in detail about the requirements and the necessary steps to apply for admission into the programs under review.

The experts see evidence that the Faculty of Chemistry and the Faculty of Biology and Biotechnology are tracking their students' progress and achievements. Thus, an instrument is in place to monitor the performance records of students with various enrolment backgrounds.

In their assessment, the experts find the admission rules to be binding, transparent, and based on HCMUS's written regulations. They confirm that the admission requirements support the students in achieving the intended learning outcomes. Regarding the credit for transfer students, adequate policies are in place.

Criterion 1.5 Workload and Credits

Evidence:

- Self-assessment report
- Module handbook, all programs under review
- Academic Regulations
- Statistical Data about the progress of studies, all programs under review
- Decision No. 4304/QD-KHTN on promulgating provision on converting credits according to the Vietnamese Qualification Framework to the ECTS.
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

HCMUS uses a credit system to track undergraduate students' progress and achievement. The ***Bachelor's degree program in Chemistry*** comprises 133-137 (Vietnamese) credits, while the ***Bachelor's degree programs in Chemical Technology, Biology and Biotechnology*** comprise 131 (Vietnamese) credits.

According to the HCMUS scheme, each credit is equivalent to 15 periods of theoretical lecture in class or 30 periods of practical laboratory work with an additional 30 periods of self-study. One period equals 1 hour, but the in-class period includes 50 minutes for face-to-face lecturers. Each theoretical credit equals 42.5 hours (15 periods x 50 minutes + 30 self-study hours), equivalent to 1.5 ECTS (42.5/27.5). At the same time, each practical credit (experiment/ discussion/ internship/ project/ dissertation/ thesis) equals 55 hours (30 periods x 50 minutes + 30 self-study hours), equivalent to 2 ECTS (55/27.5). The workload calculation is depicted in the following table:

Table 2: Workload form of categories in the academic curriculum. Source: Self-assessment report, HCMUS

Study forms	Equivalent ECTS	In-class periods	Self-study periods	Total periods	Total hours
Theoretical lecture	1.54	15	30	45	42.5
Experiment/ discussion/ internship/ project/ dissertation/ thesis	2.00	30	30	60	55

Concerning the credit system described, attention is placed on the fact that to acquire credit for theoretical, practical, or experimental modules, students must spend at least 30 self-study hours. The experts note, however, that in a workload-based credit system, students' self-study time cannot be determined by the administration as it is the time students, on average, need to meet the requirements. So, the requirements of a course have to be adjusted until the average student's self-study time meets the intended one, or the credits have to be updated.

According to the self-assessment report, self-study time is assessed through homework assignments or seminars assigned by lecturers. Lecturers evaluate the effectiveness of self-study based on the outcomes of these tasks. **However, there has not been a questionnaire to gauge students' satisfaction with their workload. To address this, the University plans to incorporate this aspect into a revised questionnaire for an upcoming survey. The audit team strongly encourages the university to verify students' workload, particularly the time allocated for self-study.**

During their exchange with the experts, the students expressed their satisfaction with the course workload. They reported having enough time to do other activities outside of study, especially in the ***Biology and Biotechnology*** programs. The students were also generally satisfied with the distribution of credits between the semesters.

It has also come to the experts' attention that, for the four programs under review, English is part of the learning outcomes but not credited. They, therefore, suggest to the University to include English proficiency in the calculation of the Grade Point Average.

As part of the self-assessment report, the University provided key performance indicators for the programs under review, encompassing data on student graduation rates and dropout statistics. For example, the outcomes for the 2018 commencing cohort reveal that out of 267 students enrolled in the ***regular Chemistry*** program, 29 had dropped (11%) out, and 179 successfully graduated by 2022 (75%). Similarly, among the 117 students in the ***Chemical Technology*** program, 13 had dropped out (11%), and 69 had graduated (66%) by 2022.

Comparatively, among the 310 students who enrolled in the ***Biology*** program in 2018, 50 (16%) had discontinued their studies, while 148 (57%) had successfully completed their degrees by 2022. Likewise, within the ***Biotechnology*** program, out of the 242 students enrolled, 26 (11%) had dropped out, while 176 (81%) had graduated by 2022.

The data indicate a generally high completion rate across the study programs, with dropout rates averaging around 11%, albeit slightly higher for the ***Bachelor program in Biology***. These findings suggest that the programs under review are generally conducive to successful completion despite some students extending beyond the formal program duration.

The experts confirm that the document "Academic Regulation on Undergraduate Level" contains provisions for the recognition of externally acquired academic achievements (Article 13). **Upon reviewing the module handbook, the audit team noted that although there is a distinction between workload associated with supervised studies and self-study time, in many cases, the workload and credit given do not fit together. Moreover, the conversion from Vietnamese credit to ECTS is not systematically applied**.

Overall, the experts were unable to verify yet whether a workload-based credit system has been established or if credits have been allocated appropriately based on workload.

Criterion 1.6 Didactic and Teaching Methodology

Evidence:

- Self-Assessment Report
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- Module handbook, all programs under review
- Discussions during the audit.

Preliminary assessment and analysis of the experts:

In its self-assessment report, HCMUS records that appropriate didactical instruments and methods are implemented for the Bachelor's degree programs under review. The variations in learning methods and tools are adjusted to the level of knowledge, skills, and competences set in each course.

Structured activities like tutorials, homework, assignments (reading or problem-based exercises), and practical activities are included in the curriculum to enhance the learning experience. Students are encouraged to use different tools, including reading textbooks, referring to documents and scientific papers, taking notes during lectures and doing Internet searches to complete homework and quizzes. Some courses also include group

project assignments to help students develop teamwork, communication, and leadership skills. The assignments and exercises enable students to develop abilities in critical thinking, written/oral communication, data acquisition, problem-solving, and presentation of academic work.

With a learner-centred approach, all courses in the undergraduate program at HCMUS are designed to encourage students to combine individual learning with peer learning.

The most common learning method is the class session, with several courses offering laboratory practice. Lecturers generally prepare presentations to aid the teaching process. With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic and soft skills. Laboratory work covers collecting and post-processing data, reporting, discussions, and presentations. Additionally, practical activities should familiarise students with academic research methods. Each year, a range of competitions such as "Students' Creative Ideas (S-IDEAS)", "Eureka - Students' Scientific Research", "Bioscience in Harmony", and "Stem Cell Innovation" foster and validate students' scientific concepts and enthusiasm for science.

To support teaching and learning activities at HCMUS, all classrooms and laboratories are equipped with computers, projectors, and internet access. To help students achieve the intended learning outcomes and facilitate adequate learning and teaching methods, HCMUS has implemented an e-learning platform (Moodle) where students and teachers can interact. Through this tool, lectures, textbooks, reading materials, and study documents are uploaded in advance for students. Online quizzes/assignments and group discussions are available via Moodle, allowing more lecturer-student communication after class hours. In addition, students have full access to the Central Library.

During the discussion with the teaching staff, the experts learned that becoming a lecturer at HCMUS requires certification from an education university. This certification equips individuals with the skills needed to develop courses and deliver presentations. Furthermore, the experts were informed about the mentorship provided to young lecturers by more experienced faculty members. As part of this support system, junior lecturers accompany senior lecturers to classes as assistants. Should they aspire to attain official lecturer status, their course materials undergo review by senior faculty members. Additionally, senior lecturers attend these classes to offer feedback and guidance. The expert team appreciates the support extended to junior lecturers and the institution's policy mandating teaching certification for its teaching staff.

Each student has access to a student portal, where the academic progress and results can be viewed. Students make course registration online every semester, where they can see information on prerequisite courses, courses to study for individual students, and courses

available in a particular semester. The score of each course will be displayed at the end of the semester.

In summary, the experts can confirm that a variety of learning methods is used and that they are aligned with the intended learning outcomes. In the discussions with students, the experts learn that they are generally satisfied with the quality of teaching and learning in the program under review.

Gathering systematic feedback on the quality of teaching and learning can be achieved through the course evaluation survey conducted at the end of each semester, which serves as a valuable source of information.

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

The experts thank the University for the provided statements and additional documentation concerning criterion 1.

(ASIIN 1.1) Availability of IPOs and ILOs on the program websites - Response No. 1
After reviewing the provided links, the experts confirm that the University has made the information publicly available. The experts appreciate the ongoing effort to update the website content and believe there is no need to issue additional recommendations in this regard.

(ASIIN 1.3) Adopting the term trimester to refer to the duration of the Chemical Technology program – Response No. 2
The assessment team appreciates the decision to use the term "trimester" instead of "semester" in the documents to avoid any misunderstandings among stakeholders. Based on this, the experts see no need to propose any further recommendations in this regard.

(ASIIN 1.3) More synergies among the programs – Response No. 3
The experts acknowledge the improvement made through the implementation of the University strategic plan. However, they suggest that more collaborative efforts in molecular biomedicine would be beneficial. Currently, stem cell technology is housed in the Chemistry Department rather than the Medical Biology Department. It is recommended that biologists and chemists work together on new molecular strategies for medicine and guide students in this direction during their training. The audit team maintains its recommendation for a more precise plan to apply synergies, which should define modules that could be offered to multiple programs in Chemistry/Chemical Technology and Biology/Biotechnology programs.

(ASIIN 1.3) Integration of modern technologies in Chemistry/Chemical Technology – Response No. 4

In the experts' opinion, the programs are making serious efforts to educate Chemistry and Chemical Technology students on environmentally relevant topics. They commend the work of the research groups involved in Green Chemistry and Environmental Chemistry projects, particularly noting students conducting thesis research in these fields. The experts also acknowledge the inclusion of Environmental Chemistry, Air Pollution Analysis, Water Chemistry, and Green Chemistry courses within the FCHEM's curriculum. Consequently, they see no need to make further recommendations concerning this matter.

(ASIIN 1.3) Increasing the English level of the student population – Response No. 5

The experts commend the University and the Faculties for their efforts to improve the English language proficiency of the students. Among its initiatives, the Faculty of Chemistry provides teaching and reference materials in English, necessary for reading scientific articles and summarising research. Regular English proficiency assessments are conducted once per semester, and there are English clubs like the BEE Club to help students practice and improve their English. The Faculty of Biology and Biotechnology has also taken various actions to increase students' exposure to the English language, including inviting lecturers from foreign universities and teaching modules entirely in English at the specialization and graduation stages. The experts appreciate these initiatives and recommend continuing to consistently enhance students' English language proficiency across all study programs.

(ASIIN 1.3) Expansion of student mobility programs – Response No. 6

The experts are glad that the University understands the importance of providing meaningful student mobility opportunities. Both the University and the Faculty of Chemistry are actively expanding their network of international partner universities to expand student exchange programs and collaborative scientific research initiatives. Looking ahead, the Faculty of Biology and Biotechnology aims to broaden its scope through new collaborations and by maximising existing academic partnerships. However, considering that this is an ongoing challenge that requires consistent and long-term effort, the experts reaffirm their initial recommendation.

(ASIIN 1.5) Requirement for students' self-study time – Response No. 7

The audit team has reviewed Circular 17/2021/TT-BGDDT and the academic regulations for undergraduate programs at the university, including those set by VNUHCM and VNUHCM-US. According to these regulations, each theoretical credit or each credit of exercises and practice requires students to have 30 hours of self-study per credit. However, the experts believe that the explanation provided does not fully address the issue outlined in the evaluation report. They maintain that in a workload-based credit system, a "requirement for self-study time" is not practicable as explicated in the report.

The experts reiterate that the University must ensure that credits are awarded for every module based on the actual workload of the students.

(ASIIN 1.5) Questionnaire on students' satisfaction with their workload – Response No. 8

The experts appreciate the plans to conduct a student survey on workload satisfaction during the current semester as part of the course evaluation. In connection with the previous point, surveying students about their satisfaction with the workload is an

important initial step. The experts emphasise the importance of having instruments in place to regularly monitor whether the credits awarded for each module correspond to the actual student workload.

(ASIIN 1.5) English proficiency in the calculation of the GPA - Response No. 9

The experts thank the Faculty of Chemistry and the Faculty of Biology and Biotechnology for clarifying that English language proficiency is a requirement students must fulfil to graduate from the programs. They also take note that for specialized English courses, grades will be factored into the student's GPA, as verified in the transcript of records. Additionally, they note that general English proficiency, beyond the required credit hours, must be certified upon graduation. Based on this additional information, the audit team sees no need to issue further recommendations on this matter.

(ASIIN 1.5) Revision of Module handbook – Response No. 10

The audit team appreciates that the Module Handbook for the Bachelor of Science in Biology and Bachelor of Science in Biotechnology has been updated to include the total workload, as well as the breakdown for lectures, practical courses, and self-study hours. In addition, the module credits are now calculated and specified according to university regulations. However, the responsible lecturer for several modules is still not indicated. Furthermore, the module descriptions for the thesis and internship (practical project) still need to be added. The experts also notice that the FCHEM Module Handbook includes four English courses, while there is no language course in the FBB Module Handbook.

The Module Handbook for the Bachelor of Science in Chemistry and Bachelor of Science in Chemical Technology has also been updated to include ECTS credits. However, there are still some inconsistencies. For example, Module BAA00021/23 specifies a total workload of 75 hours and 2 credits (3.5 or 4.5 ECTS credits). However, 3.5 or 4.5 ECTS credits actually correspond to 105 or 135 hours of workload.

Given these considerations, the experts reiterate the initial requirement.

(ASIIN 1.5) Implementation of a workload-based credit system – Response No. 11

In the experts' opinion, there still remains a problem with the credit system applied in the Module Handbooks and in general for the conception of the study programs. In this system, theoretical working hours count double as much as practical working hours. It is acknowledged that the credit system is based on current regulations from the Ministry of Education, but the assessment team believes that it contradicts the principle of equally crediting every working hour. Having two different formulas to convert theoretical or practical Vietnamese credit points into ECTS credit points may not be a practical way to solve the problem.

The experts ask the University to ensure that credits are awarded for each module in accordance with the actual workload of the students.

The experts consider criterion 1 to be partially fulfilled.

2. Exams: System, Concept and Organization

Criterion 2 Exams: System, concept and organization

Evidence:

- Self-assessment report
- Module description, all programs under review
- Academic Regulation on Undergraduate Level
- Examination-related procedures and regulations, including:
    - Provision Educational Testing of VNUHCM-University of Science
    - Provision Responsibilities of Staff and Learners in the Examination Sessions of VNUHCM-University of Science
- Samples of student's work (projects, exams and thesis), all programs under review
- Discussion during the audit.

Preliminary assessment and analysis of the experts:

i. Forms of Examinations and Exam Schedule

According to the self-assessment report, progress assessment, midterm assessment, and final assessment evaluate students' academic performance in the programs under review.

Exams measure students' learning outcomes according to a predefined grading scale reference. The module handbook specifies the course's learning outcomes (CLOs) and identifies the types of examinations used to assess students' achievement on those CLOs.

The final grade of a course is a combination of the different assessment methods. The progress assessment is carried out during the course's learning process and the component usually includes homework, quizzes, teamwork, assignments, and other class assignments. The midterm assessment (midterm exam) is carried out in the middle of the term. It can include an exam, essay, or report. The final assessment (final exam) is carried out at the end of the course and can be done through an exam, written report, oral presentation and exam, or project assignment.

The most common type of evaluation used is written examinations. However, other examination forms may contribute to the final grade. Written examinations typically include short answers, essays, problem-solving or case-based questions, and calculation problems. Some lecturers also give multiple-choice or true-false questions in examinations or quizzes. The grade from laboratory work usually consists of laboratory skills, discussions, reports, and oral exams.

In their exchange with the experts, students from the Faculty of Chemistry confirmed there are a variety of tests, mentioning written assessments among them. Similarly, students from the Faculty of Biology and Biotechnology highlighted a balanced approach to learning, encompassing both learning by heart and assessments that demand critical thinking. They also noted that the proportion of multiple choice questions is predominant at the beginning, with a shift towards more critical-thinking-oriented questions in senior years.

The students learn about mid-term and final exams through the exam schedule published by the Educational Testing and Quality Assurance Office on the web and the Students' portal. The examination forms are specified in the module description and explained to the students by the lecturers on the first day of each course.

All in all, the experts confirm that a range of university-wide regulations governs all examinations and their conduct across the different programs. Exams for the Bachelor's programs under review follow detailed policies by the University.

ii. Grading and Graduation Requirements

Module grade on a 10-point scale, which is the final grade to evaluate the module outcomes, calculated from total component marks multiplied by the respective weights. The final grade of the course is given as a quality letter and quality score as shown in the Table below.

Table 3: Grading Category. Source: Appendix Self-assessment report, HCMUS.

10-point scale	Grade	Classification	Study results
9.0 to 10.0	A+	Excellent	Pass
8.0 – below 9.0	A	Very Good	Pass
7.0 – below 8.0	B+	Good	Pass
6.0 – below 7.0	B	Fairly good	Pass
5.0 – below 6.0	C	Average	Pass
4.0 – below 5.0	D+	Weak	Fail
3.0 – below 4.0	D	Poor	Fail
Less than 3.0	E	Poor	Fail

To pass a course, students must achieve a minimum of a "Pass" grade (5.0 or C). For mid-term and final exams, the instructors should deliver the grades within two weeks after the test date. The course grades are published on the Office of Educational Testing and Quality Assurance website and transferred to the student portal system.

There is a minimum attendance requirement in each course for students to be allowed to take the final examination, which is specified in the module description. In case students are unable to attend examinations due to unexpected circumstances such as sickness, accidents, or other reasons, they have a right to resit or reschedule the examination. Student grade appeals are also clearly regulated and announced on the website, a fact confirmed by the students during the audit. The students explained to the experts that in the event of identifying any errors, they have the option to reach out to the department for clarification. Subsequently, lecturers are contacted and tasked with reviewing the examination in question.

According to HCMUS academic regulation, in case of course failure, students must retake the course. They must re-register until they pass (unlimited number of retakes).

Students in the interviews confirmed that they were aware of all necessary information regarding examination schedules, forms, and grading rules at the beginning of the course. They are reportedly given sufficient time to prepare adequately for the exams.

To graduate from the ***Bachelor of Science in Chemistry*** and ***Bachelor of Science in Chemical Technology*** programs, students must have completed the required 131-137 credits, including a 10-credit graduation thesis.

Similarly, to graduate from the ***Bachelor of Science in Biology*** and ***Bachelor of Science in Biotechnology*** programs, students must have completed the required 131 credits. However, as described earlier under Criterion 1.3, there are three graduation paths for the students:

- **Internship-based graduation**: Students intern at a factory, hospital, company, institute, or research centre suitable for their selected biological area. After finishing the internship, they submit a report and must take six more credit courses.
- **Thesis-based graduation**: students must conduct research, write a bachelor thesis, and defend it in front of a scientific committee totalling 10 credits.
- **Course-based graduation**: students must take courses for 10 credits.

Given the variety of graduation paths available—internship-based, thesis-based, or course-based—for the ***Biology/Biotechnology programs***, the experts asked the program coordinators how essential skills acquired through thesis work are preserved. The coordinators clarified that regardless of the chosen path, students must conduct experiments, analyse data, write reports, and present findings to a committee. In course-based graduation, students engage in literature reviews and experimental design. Some students may aspire to careers beyond research, such as marketing; therefore, multiple graduation options cater to diverse aspirations. However, industry representatives

emphasised to the audit team the significance of a thesis when recruiting. **Following discussions with the stakeholders, the expert panel recommends adopting the Bachelor's thesis as the only graduation form.**

iii. Thesis

Available projects for thesis research are made visible to students at the beginning of their last semester. Typically, if they commence their research during this period, they are expected to dedicate a minimum of 20 hours per week to their laboratory work. The research process entails data analysis and drafting, with subsequent evaluation by both the supervisor and a designated reviewer. Upon meeting the requisite standards, students undergo a thesis defense, during which they present their work to the Committee. The final grade is determined by inputs from the supervisor, reviewer, and all Committee members (comprising 3-5 members).

During the discussion with the expert group, the teaching staff expanded on how students choose their thesis supervisor. Staff members from both Faculties confirmed that during "Open Days", students receive information about supervisors who announce their research topics. Senior students are subsequently integrated into research groups, enabling them to join these initiatives. Additionally, the respective department websites feature lists of projects available for each academic year. They also highlighted the role of the Academic advisors as they provide essential information about the department and offer guidance to students. The experts believe that thesis work is well-integrated into the research fields of the Faculties.

In assessing this criterion, the expert group finds that appropriate university-wide and Faculty-specific rules and procedures govern the examination systems. These rules and procedures are adequately communicated and transparently published. The students in the interviews confirmed that they were aware of all necessary information regarding examination schedules, forms, and grading rules. They are reportedly given sufficient time to prepare for the exams.

Lecturers, in the discussion, reported that a variety of exam forms, including a mix of oral and written exams, are used to check the attainment of the respective learning outcomes. The experts acknowledge that forms and assessment rubrics to assess the quality of the student's work are available for all programs under review.

The experts also inspected a sample of examination papers and Bachelor's theses and were satisfied with the general quality of the samples. **However, they suggest that the Bachelor's thesis contains an abstract in English.**

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

The experts thank the University for the provided statements and additional documentation concerning criterion 2.

(ASIIN 2) A thesis as the only form of graduation for the Biology/Biotechnology programs – Response No. 12

The experts appreciate that a Bachelor's thesis is compulsory for all students at FCHEM. Regarding Biology and Biotechnology, the students currently have the option to complete either a bachelor thesis or a mandatory graduation project. However, the assessment team believes, supported by the opinion of stakeholders, that the Bachelor thesis must be adopted as the sole form of graduation. They argue that a project involves less independent experimental design and individual intellectual effort, which are crucial expectations for every Bachelor's degree completion. Therefore, they maintain their initial requirement and ask the university to ensure that the Bachelor's thesis is the only form of graduation.

(ASIIN 2) Thesis abstract in English – Response No. 13

The experts acknowledge that at FCHEM, English-enhanced programs require students to write summaries in both Vietnamese and English. However, they recommend that this practice should not only be limited to English-enhanced programs but also extended to regular programs. In Biology and Biotechnology, and building on the previous point, they recommend including an abstract in the future Bachelor's thesis.

The experts consider criterion 2 to be mostly fulfilled.

3. Resources

Criterion 3.1 HR Resources, Staff Development and Student Support

Evidence:

- Self-assessment report
- Staff handbook
- DECISION on promulgating the regulation of the working regime for lecturers of VMUHCM-University of Science
- Discussions during the audit

Preliminary assessment and analysis of the experts:

i. Staff

HCMUS's teaching staff are categorised as 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.

All full-time teaching staff members are expected to be involved in teaching/advising, research, and administrative services. However, the workload can be distributed differently between the three areas from teacher to teacher, depending on the academic position. For example, full professors spend more time on research activities and less on teaching than associate professors or lecturers.

Based on the self-assessment report, the ***Chemistry/Chemical Technology*** programs have a total of 122 teaching staff members. This includes 1 full professors (1%), 10 associate professors (8%) and 111 lecturers (91%). 43% of the teaching staff hold a Doctorate degree, and 75 are full-time.

The University also provides information for the ***Biology/Biotechnology*** programs, which have a teaching staff of 128 members. This comprises 1 full professor (1%), 11 associate professors (9%), and 116 lecturers (91%). Additionally, 46% of the teaching staff hold a Doctorate degree, and 95% are full-time.

In terms of lab support, the Faculty of Chemistry operates with 32 technician-staff members across its 32 laboratories, overseen by a Head of Laboratories for overall management. Similarly, the Faculty of Biology and Biotechnology has 15 teaching assistants and lab technicians recruited to support teaching and research. As per feedback provided by the teachers, there is no shortage of staff members to oversee practical lab work for the programs.

The Vietnamese government has set specific staff-student ratios for universities. The ideal ratio of staff to active students is 1:20. The table below displays the 2023 data on the ratios for the programs under review:

Table 4: Ratio of Academic Staff-Active Students. Source: Appendix Self-assessment report, HCMUS.

Major	Active students	Full-time Faculty Academic staff	Full-time Academic Staff of the University who are responsible for General Modules	Visiting lecturers	Ratio (Number of Active students/ Number of full-time faculty Academic staff)
Biology	1017	81	80	34	6.3
Biotechnology	1534	86	128	79	7.2
Chemistry	1436	75	32	25	13.4
Chemical Technology	502	55	35	20	5.6

As part of its human resource plans, the University has developed a job placement scheme. Accordingly, each unit within the University lists and classifies tasks in alignment with their functions, missions, and power. They identify the list of employment positions within the unit, develop job descriptions for each employment position, define the capacity framework of each position, and identify job titles and the number of people needed. This serves as the basis for the University's plan for evaluating, recruiting, training, and appointing staff.

Regarding promotion, teaching staff have to follow a system regulated by the government. The teaching staff's promotion to a higher academic position is based on a complex evaluation system. This system includes factors such as research, publications and the supervision of students to determine a teacher's eligibility for promotion.

ii. Job Conditions and Performance Review of Staff

HCMUS has established policies and evaluation methods to review staff performance in the three essential dimensions of teaching and supervision, scientific research, and the regular missions of the Faculty/Department.

Teaching performance parameters include workload at the required benchmark of 270 hours/year and student satisfaction as measured by the end-of-semester survey. Research performance considers the volume of research conducted, published papers, conferences attended, and international cooperation activities on science and technology.

According to the policy of HCMUS, faculty members are eligible for salary increases every three years, with the possibility of shorter intervals based on exceptional achievements in research, academic activities, outstanding publications, and active participation in faculty obligations. Non-material incentives such as health check-ups, combined professional and extra-curricular activities during vacations, and scholarship programs for faculty's children are provided to improve the staff's well-being. Additionally, the University's Trade Union organises support activities, including visiting sick employees and offering welfare regimes.

iii. Staff Development

HCMUS encourages the training of its academic staff to improve their didactic abilities and teaching methods. As stated in the self-assessment report, academic staff at the Faculty of Chemistry and Faculty of Biology and Biotechnology frequently undergo training to increase their competence and update their knowledge in their field of studies to understand recent issues.

The University assesses training needs and developmental activities based on the job placement scheme mentioned above. Faculty members are encouraged to present their research papers at national and international conferences, and they receive financial support for these activities. Both faculties also organize scientific seminars and conferences to help lecturers update their expertise.

Newly recruited lecturers are encouraged to take teaching training courses. Faculty members are also occasionally trained to ensure they stay updated with the latest technologies and methodologies in teaching and research.

The experts discuss the various opportunities available for personal skill development with the teaching staff members. The teachers express their satisfaction with the internal qualification program and willingness to improve their didactic skills. Additionally, they can attend conferences, workshops, and seminars abroad.

In their appreciation of this criterion, the experts come to the following conclusions:

In the experts' opinion, the teaching staff's composition, scientific orientation, and qualification are suitable for successfully implementing and sustaining the programs under review.

During the discussions with the expert team, the lecturers confirmed that various professional development options are available. The experts appreciate the University's efforts to support teaching staff in developing their skills.

During the interviews, teaching staff expressed satisfaction with their working conditions and professional development opportunities and exhibited a strong commitment to their students. Students are equally satisfied with the approachable, enthusiastic, and motivated teaching staff and with the learning environment.

Criterion 3.2 Funds and equipment

Evidence:

- Self-assessment report
- Discussion during the audit
- Guided tour through the University’s facilities and laboratories

Preliminary assessment and analysis of the experts:

i. <u>Funds</u>

According to information provided in the self-assessment report, the University's primary funding sources are the students’ tuition fees and the funds provided by the Vietnamese

government (mostly for salaries). Other sources of funding include research grants and, although limited, partnerships with domestic and international partners.

During the discussion with representatives from the President's Office, it was clarified that HCMUS attained autonomy in 2022, thereby assuming responsibility for expenditures and income. Given that the primary source of funding is tuition fees, the University relies on student enrolment numbers. However, investments in infrastructure, such as buildings and laboratories, can be supported by government funding. Funding from the industry remains low, a reality of most Vietnamese universities.

In their exchange with the experts, the program coordinators and the teaching staff confirmed that there is basic funding from the University for teaching and research activities. This funding is centrally allocated. Additionally, the Vietnamese government, via the Minister of Technology, can provide supplementary funds for research activities; however, teachers are required to submit applications to access these funds.

In terms of potential bottlenecks, the assessment team learned that when teachers utilise government funds to purchase chemicals, it often involves a lengthy procedure spanning up to three months. This delay can impede the effective functioning of teaching labs. The experts suggest that the university prioritise expediting the processing of orders for basic laboratory supplies to ensure seamless teaching operations.

ii. Collaborations

As part of its self-assessment report, the University provided a list of cooperation agreements with both local and international universities, as well as research centres and industrial partners. This was also reflected during the discussion round with industry representatives and the teaching staff, where collaborations with various partners were highlighted.

The assessment team appreciates the programs' efforts in establishing strong collaborations with international partners, including those from Taiwan, France, Sweden, the United States, Japan, and Korea. Additionally, they commend the teaching staff for their strong motivation towards research and their openness to international collaboration.

iii. Infrastructure and technical equipment

To evaluate the quality of infrastructure and technical equipment, the assessment team visited both campuses of the university: Campus 1, located in District 5, and Campus 2 in Thu Duc City, approximately 20 kilometres away from District 5. During the visit, the team had the opportunity to tour selected research and basic laboratories in the fields of Chemistry, Chemical Technology, Biology and Biotechnology. These included:

Campus 1:

- Molecular and Environmental Biotechnology Laboratory
- Central Laboratory of Analysis
- Genetics Laboratory
- Analytical Chemistry Laboratory
- Applied Physical Chemistry Laboratory

Campus 2:

- Stem Cell Laboratory
- Cancer Laboratory
- Central Laboratory for Analysis
- Inorganic Chemistry Laboratory
- Cancer Research Laboratory
- Medicinal Chemistry Laboratory
- General Biology-Biotechnology Laboratory
- Industrial Basic Biology-Biotechnology Laboratory
- High-tech Agricultural Research and Application Center

In their appreciation of the quality of infrastructure and equipment, the experts come to the following conclusions:

Due to architectural constraints, most laboratories on Campus 1 are spatially limited and, therefore, suitable mainly for research work within the framework of theses and PhD studies. Consequently, students' basic training primarily takes place at Campus 2. **However, the inconvenience of commuting between campuses, spanning a 20-kilometer distance that takes up to 45 minutes, may represent a significant challenge for students.**

The experts are under the impression that the size and logistics of operational activities of many labs at Campus 1 may no longer align with safety regulations. This aspect warrants the University's attention since it may impact the mindset that future generations bring to the future workplace or the set-up of new labs for institutions and industries.

The university boasts state-of-the-art analytical equipment and a cutting-edge Stem Cell and Cancer Laboratory, particularly catering to the Chemistry and Chemical Technology study programs.

While many labs in both Faculties are modern and well equipped, it would be important to further implement international standards such as ISO, GLP, or others. This would ensure that students working in those labs can get familiar with these standards.

Furthermore, there is an investment gap between research labs and teaching labs, which needs to be addressed by the University/Faculties. **The audit team requests, for all study programs, an overview of which experiments are exactly conducted in each practical course in the labs and the dedicated experimental laboratory equipment for educational purposes, including quantities.**

The basic laboratories of all programs can accommodate a large number of students. **However, the experts noted a clear need for renewal, especially concerning the teaching of basic chemistry techniques to students in their second or third year of study. This includes analytical weighing and titration, separation methods in inorganic chemistry, synthesis equipment in organic chemistry, multiple rotary evaporators, as well as necessary distillation apparatus (including vacuum and steam distillation). The assessors recommend providing a detailed overview demonstrating that the university possesses sufficient equipment for the basic training of all chemistry and chemical technology students, along with summaries of the specific experiments conducted in each practical session.**

Furthermore, all laboratories must be set up to ensure more safety. Large gas cylinders should be securely fastened with straps, and all wooden cabinets and shelves should be replaced with chemically and fire-resistant materials. This applies to test tube racks in basic laboratories as well. The University must guarantee adequate filtration of all ventilation systems. In any laboratory where organic solvents are handled on a large scale, it is critical that this is done under extraction hoods. Moreover, proper handling of potentially dangerous microorganisms, along with containment and labelling of GMOs, must also be ensured.

The biology and biotechnology laboratories are capable of emulating modern biotechnology practices at an industrially relevant level. Foundational training in zoology, botany, and physiology is conducted in spacious large-scale laboratories accommodating up to 80 students each. **However, renovations and adjustments in both furniture and necessary equipment are warranted to accommodate pairs of students for preparative and microscopic work effectively. In addition, the assessment did not encompass inspection of facilities for cellular and molecular biology, as well as microbiology, pertinent to the biology and biotechnology study program.**

To compete in the fields of Biology and Biotechnology on an international level, it is important to ensure that all students are familiarised with basic molecular biology techniques at least by their third year of study. These include electrophoresis, DNA extraction, PCR analyses, site-directed mutagenesis, transformation and transfection, cell lysis, protein chromatography, activity tests, and immunoblotting. Work with DNA or

microorganisms must also be conducted under a clean bench for safety and sterility reasons. To document the available equipment, a list of the existing devices (including quantities) and an overview of the specific practical experiments (associated with the respective courses) are requested.

The assessment team also noted that the teaching labs on Campus 2 are situated on higher floors without elevator access, which poses challenges in transporting heavy laboratory equipment. As a possible solution, the experts suggest installing an external elevator. Additionally, it might be beneficial to have air conditioning in rooms, particularly given the hot weather conditions in Ho Chi Minh City.

Moreover, the experts got the overall impression that the management of different labs seems different/separated, which may not be under the same systematic management procedure. Thus, a consolidated and supportive operational team may help to improve all lab functions.

The audit team also had the opportunity to visit the Central Library and confirmed that it offers a range of resources, including books, journals, theses, scientific reports, e-books, and online data. In addition to physical resources, the library provides access to online materials through connected computer systems and IportLib software for document lending. The use of open-source software like Greenstone allows for the creation of full-text versions of theses and research articles. Furthermore, students have access to the central library of VNUHCM, linked to other libraries in VNUHCM members, providing reference materials for study and research. Overall, the experts were highly impressed with the library's facilities for students, including workspace availability and access to textbooks, e-books, and journals.

iv. Supporting resources for staff

HCMUS provides comprehensive support for its lecturers, including various opportunities to pursue higher academic degrees abroad, participate in national and international conferences, and receive training to enhance didactic and managerial competencies. Funding for research is available from several sources, including the University, government, and national and international institutions.

HCMUS also supports lecturers in disseminating the results of their research. HCMUS's support for research and publication is well-recognised by associate professors, lecturers and PhDs. The expert team commends HCMUS for its well-established and developed service units that support research and publications.

v. Supporting resources for students

HCMUS offers a range of support services for its student population. Students are assigned an academic advisor who is a member of the academic staff. The academic advisor is the first port of call if a student needs advice or support on academic or personal matters. They also offer suggestions regarding relevant careers and skills development and help if any problems arise. Two annual events organized by academic advisors, which draw significant student participation, are the Laboratory Orientation for second-year students and the Major Orientation for third-year students.

Before the start of the semester, the advisors help students plan for their next courses. Students register for courses through the student portal system.

In general, during their interaction with the experts, students highlighted the approachability of teachers, which contributes to building a fruitful interaction.

The fourth-year students who prepare their thesis have one or more supervisors selected based on the topic of the final project. One supervisor could be external if the student performs the research outside HCMUS. The Program Coordinators informed the audit team about the strict regulations regarding the maximum number of students each teaching staff member can supervise. Once the lecturers reach their capacity, students are required to select another available lecturer. Typically, the role of the thesis supervisor involves guiding students through the completion of their final project, encompassing both research and the final project report.

Moreover, the Student Assistance Center serves as an information system and service channel to support student life at the University. It provides updated information on career workshops, scholarships, soft skills, and student learning services. Students also receive program-specific support through the offices of the Faculty of Chemistry and the Faculty of Biology and Biotechnology, respectively.

Finally, several student organisations at HCMUS, including the Communist Youth Union, provide students with support during their learning process. Students can also participate in many academic, extracurricular, and sports activities.

Concerning the quality of student services and counselling, the experts positively note the good and trustful relationship between the students and the teaching staff. Enough resources are available to provide individual assistance, advice and support for all students. The support system helps the students achieve the intended learning outcomes and complete their studies successfully. **However, there was a concern regarding the new websites for the programs, as students would like to see a more user-friendly approach and more information displayed. Consequently, the experts recommend improving and**

regularly updating the digital platforms available to students to ensure optimal usability and access to relevant information.

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

The experts thank the University for the provided statements and additional documentation concerning criterion 3.

(ASIIN 3.2) Expediting orders for basic laboratory supplies – Response No. 14
The experts acknowledge that the procurement of chemicals and equipment in public institutions must adhere to government-regulated bidding processes. They appreciate the university's efforts to improve this procurement process specifically for chemicals and equipment used in practical applications. However, since the results of these efforts are expected in the near future, the experts uphold their initial recommendation

(ASIIN 3.2) Commuting between Campus 1 and Campus 2 – Response No. 15
The audit team appreciates that the University has optimised the timetable for practical work, offering students the choice to practice throughout the day or attend sessions at Campus 2, thereby enhancing commuting flexibility. Since this arrangement allows students to better manage their commuting time, the experts find no need to make further recommendations in this regard.

(ASIIN 3.2) Campus 1 labs' alignment with safety regulations – Response No. 16
The experts note the University's forthcoming plans to upgrade and equip the Chemistry/Chemical Technology laboratories to meet either general or industry-specific safety standards. Additionally, they acknowledge the university's intention to relocate Biology/Biotechnology to Campus 2 for future student studies and research. Meanwhile, laboratories at Campus 1 will primarily cater to postgraduate training without being overloaded. However, as these measures have not yet been implemented, the experts maintain their recommendation that the operational activities and logistics of the labs at Campus 1 should align with safety regulations.

(ASIIN 3.2) International standards in both Faculties labs – Response No. 17
The audit team appreciates FCHEM and HCM-US's plans to gradually make adjustments to meet laboratory safety standards. The team also acknowledges that two laboratories, the Stem Cell Laboratory and Tissue Engineering and Biomaterials Laboratory of FBB, already meet the international ISO/GMP standard, and the core lab scheduled to open in August 2024 has been designed based on GMP. It is also commendable that students are encouraged to take training programs of international standards such as ISO, GLP, or others offered by external units. The experts see no need for additional recommendations in this matter.

(ASIIN 3.2) Overview of experiments and dedicated equipment - Response No. 18

The experts acknowledge the information the Faculties have provided on the experiments, alongside the list of equipment in the laboratories. Even though they are satisfied with the information provided regarding instrumentation, details on the practical courses and illustrations on how these are conducted, it would have been beneficial to receive a consolidated table for each study program listing: Subject, Student Laboratory Experiments, and Corresponding Equipment, instead of multiple individual files.

(ASIIN 3.2) Renewal and improvement of Chemistry/Chemical Technology teaching labs equipment – Response No. 19

Upon reviewing the response from the Chemistry/Chemical Technology programs, the experts believe that the University needs to outline a plan, with clear milestones, on how to renew and improve the equipment for the basic training of all Chemistry and Chemical Technology students.

(ASIIN 3.2) Ensuring more safety in all laboratories– Response No. 20

The experts appreciate that, before conducting experiments, students are required to attend an orientation session on laboratory safety and receive basic first aid instructions in case of emergencies. However, the experts believe that the safety aspects of wooden furniture and laboratory tools (fire hazard) were not fully addressed. Using wood in the laboratory must be avoided. Therefore, the audit team is asking the University to provide a clear response on when it intends to eliminate these safety weaknesses. Additionally, the experts note that the ceiling exhaust system is outdated and offers insufficient protection against splashing chemicals and toxic fumes. In this regard, the experts expect the University to provide a concrete timeline for implementing a better exhaust management system.

(ASIIN 3.2) Molecular Biology and Microbiology for Biology/Biotechnology – Response No. 21

Based on the information provided, the experts note that Molecular Biology and Microbiology seem to primarily involve observation techniques, not genetic analyses, and even less genetic engineering to improve or correct traits. The available equipment was not clearly outlined, but the provided photos mainly show students using Eppendorf pipettes or plating on microplates. However, the assessment team expects that university education should also involve the use of state-of-the-art equipment. There appears to be a shortage of essential equipment such as gel electrophoresis systems, centrifuges, FPLC, clean benches, microplate readers, Western blot devices, UV-Vis spectrophotometers, and thermocyclers, among other things.

As a result, the experts request the university to create an action plan with defined milestones. This plan should address various aspects, including the optimisation of safety measures in the air management system, with a specified timeline. Additionally, there should be a comprehensive plan detailing the incorporation of contemporary molecular biological techniques into biology and biotechnology education. The experts strongly believe that students should not only learn how to visualise cells, proteins, and genes but also learn how to analyse and modify them when necessary.

(ASIIN 3.2) Cellular and Molecular Biology techniques for <u>Biology/Biotechnology</u> – Response No. 22

After reviewing the University's response to the request for training in Cellular and Molecular Biology techniques that meet international standards, the experts note that it does not adequately address the concerns raised. It is believed that a cultural shift is necessary to transition from classical biology, which observes and draws conclusions, to causally analyse or optimise using genetic engineering or protein engineering. Modern biology, at both the cellular and molecular levels, has significantly advanced internationally. Biologists now detect mutations or gene clusters, understand regulatory phenomena, and use their knowledge to shape biology. Modern techniques such as various PCR methods, direct protein evolution, RNA interference, or CRISPR-Cas are now part of the basic curriculum at many universities. The creation of new medications using genetic engineering techniques is currently leading worldwide, particularly in tumour biology and vaccine development. Therefore, in connection with the point mentioned above, the experts request the university to present an action plan on how modern aspects of biology will be practically and contemporarily taught in the future. **The university is encouraged to move in its education from mere observation and analysis of cellular and genetic conditions to direct evolution, genetic engineering, and gene targeting.**

(ASIIN 3.2) External elevator and air conditioning at Campus 2 – Response No. 23

The audit team appreciates the additional information provided and is pleased to learn that specialized elevators are available for transporting chemicals and equipment. They also welcome the initiative to ensure that all classrooms at Campus 2 will be equipped with air conditioning from the upcoming semester. Based on this information, the experts do not have further recommendations in this regard.

(ASIIN 3.2) Labs management – Response No. 24

The expert group acknowledges the provided explanation, which outlines the physical layout and organisational structure of the laboratories, including the roles of lab staff and management practices. However, in the group's opinion, this explanation does not directly address the concern about the lack of a systematic management procedure across different labs or the need for a consolidated operational team. It is observed that while the explanation acknowledges the existence of different management methods between the two laboratory systems (school and faculty), it does not propose any specific steps to unify these practices or create a consolidated operational team. Although adherence to general regulations and safety measures is noted, there is a lack of specific actions or improvement plans to enhance the systematic management of labs. Consequently, the experts maintain their recommendation, emphasising the importance of an action plan with expected milestones and timelines.

(ASIIN 3.2) Improving and updating digital platforms– Response No. 25

The experts acknowledge the efforts of the four programs to enhance communication channels with students, particularly through the use of social media to promptly deliver updated information. They commend the intention to explore further enhancements to

make the platform more user-friendly. Given these efforts, the experts find no need to make additional recommendations on this matter

The experts consider criterion 3 to be partially fulfilled.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Self-assessment report
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- Module handbook, all programs under review

Preliminary assessment and analysis of the experts:

The module descriptions for the programs under review were provided as appendices to the self-assessment report. The information for the ***Bachelor's programs in Chemistry and Chemical Technology*** is available on the HCMUS's website. It is thus accessible to the students and interested stakeholders.

However, the experts note that the module descriptions provided appear to be unavailable through the Faculty of Biology and Biotechnology's website. The experts hence emphasise that module descriptions, including all required module information, need to be published in full detail (e.g., in PDF format) to be accessible to all interested stakeholders. The experts ask the program coordinators to review and publish the module handbooks for the *Bachelor of Science in Biology* and ***Bachelor of Science in Biotechnology*** **study programs accordingly.**

After studying the module descriptions, **the assessment team also observed that the module handbook has to be revised and completed concerning the responsible person, and self-study hours, workload, and credit have to fit together. For the Internship and Thesis, the module description should be supplemented.**

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Self-assessment report
- Sample Transcript of Records, all programs under review
- Sample Diploma/Degree Certificate, all programs under review
- Sample Diploma supplements, all programs under review

Preliminary assessment and analysis of the experts:

According to the information provided in the self-assessment report, students from the programs under review receive a Diploma Certificate, accompanied by an Academic Transcript and a Diploma Supplement after graduation.

The Diploma Supplement is an official statement letter issued by the Academic Affairs Office. It contains information about the student (study period, classification, and mode of study), the program (construction approach, language of instruction, English language requirements, required credits and duration) and specific courses and grading procedures.

The ASIIN experts are provided with samples of these documents. The experts confirm that the students of the Bachelor's degree programs under review are awarded a Diploma Certificate, a Transcript of Records, and a Diploma Supplement. The Transcript of Records lists all the courses the graduate has completed, the achieved credits, grades, and cumulative GPA. The documents are presented in Vietnamese and English.

Criterion 4.3 Relevant rules

Evidence:

- Self-assessment report
- University's website: https://hcmus.edu.vn/
- Ba Chemistry & Ba Chemical Technology website: https://chemistry.hcmus.edu.vn/
- Ba Biology & Ba Biotechnology website: https://fbb.hcmus.edu.vn/
- All relevant regulations, as appendices to the self-assessment report
- Discussion during the audit

Preliminary assessment and analysis of the experts:

The relevant rules and regulations were provided as appendices to the self-assessment report. Based on that and the information stated in the self-assessment report, the assessment team confirms that the rights and duties of both HCMUS and the students are defined clearly and bindingly.

In addition, the students confirmed during the audit that they receive all relevant course information at the beginning of each semester.

However, the experts note that the rules and regulations provided seem to be inaccessible through the University's or Faculties' websites, thereby rendering them unavailable to relevant stakeholders. The experts highlight the importance of publishing relevant rules and regulations to ensure accessibility for all interested stakeholders.

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

The experts thank the University for the provided statements and additional documentation concerning criterion 4.

(ASIIN 4.1) Transparency and accessibility of Biology/Biotechnology module description – Response No. 26
The experts confirm that the University has published the module handbooks for the Biology/Biotechnology study programs. Therefore, the documents are accessible to all interested stakeholders. The assessment team believe that there is no need to issue additional recommendations in this regard.

(ASIIN 4.2) – Revision of the module descriptions for the four programs – Response No. 27
The assessment team recognises the University's efforts to revise and complete the module descriptions for the four programs under review. However, as indicated in Criterion 1, certain information is still missing and inconsistencies need to be addressed. The module handbooks of the Biology/Biotechnology degree programs do not include module descriptions for the internship and Bachelor's thesis. Since these courses are part of the degree programs, the experts ask the University to provide a module description for them. As a result, the experts maintain the requirement in this regard.

(ASIIN 4.3) Transparency and accessibility of relevant rules– Response No. 28
The experts have reviewed the link provided by the University and confirmed that the relevant rules are accessible to all interested stakeholders. The assessment team believe that there is no need to issue a recommendation in this regard.

The experts consider criterion 4 to be mostly fulfilled.

5. Quality management: quality assessment and development

Criterion 5 Quality management: quality assessment and development

Evidence:

- Self-assessment report
- Academic handbook
- Surveys' reports, all programs under review
- Discussion during the audit

Preliminary assessment and analysis of the experts:

As described in the self-assessment report, the Educational Testing and Quality Assurance Office coordinates the implementation of internal quality assurance at the university level. Meanwhile, quality assurance processes at the faculty level are managed by the Quality Assurance Team and, at the educational program level, by the Quality Assurance staff.

In their discussions with the program coordinator, students, and industry partners, the experts discussed HCMUS's quality management system. All parties confirmed that the University has procedures in place to improve the quality of its programs. As part of these processes, HCMUS regularly reviews and enhances the curriculum. Typically, the review is initiated based on feedback from stakeholders collected by the Educational Testing and Quality Assurance Office through surveys and consultation. The Faculties also engage in direct dialogues with stakeholders. Using the gathered information, the Office of Academic Affairs and the faculties assess and update the study programs.

Based on the evidence provided, several mechanisms are in place to collect student feedback throughout the student lifecycle. These include surveys conducted among students who have completed the initial two-year period, encompassing general and fundamental courses. Additionally, there are surveys focused on evaluating graduation courses, such as the graduation thesis and practical project, aimed at enhancing their quality. Furthermore, program outcomes surveys are conducted upon graduation to assess whether graduates have acquired, retained, and can apply the knowledge gained during their studies. Moreover, reports on the employment status of students at the time of graduation are also generated.

At the end of each semester, the Educational Testing and Quality Assurance Office conducts a student satisfaction survey to gather feedback on modules and lecturers. The survey results are shared with the relevant lecturers, and any issues are discussed at University or Faculty board meetings to find solutions. Changes to the course specification or syllabus

may be made based on the report results and the current class's performance compared to previous years.

During the audit, the students confirmed that they are asked for end-of-semester feedback about many aspects on teaching methods and the lectures. Teaching staff often use student inputs to enhance their didactics and content for the next semester.

To stay up-to-date with the constantly evolving labour market and emerging technologies, the faculties conduct surveys of the labour market from companies that accept students for internships. At the end of their internship, the company supervisors give feedback on the student's performance, including specific knowledge, generic skills, specific skills, and attitudes. Feedback from internship companies is usually applied immediately, whenever possible, for the benefit of the next intern.

During the on-site visit, the experts learned that the program under review engages with employers by gathering feedback through surveys and inviting them as guest lecturers. The experts acknowledge the significance of the employers' input for the program's improvement and encourage the University to continue involving employers in the process.

The experts consider that HCMUS, the Faculty of Chemistry, and the Faculty of Biology and Biotechnology conduct sufficient evaluations to regularly survey the opinions of students, stakeholders, and staff.

In response to inquiries regarding their representation in the University's boards and involvement in decisions affecting their programs, students conveyed to the experts that they can engage with the University's leadership through annual meetings. These gatherings serve as a platform for students to voice their opinions on areas requiring improvement. The students expressed satisfaction, noting no significant complaints about the academic programs. They acknowledged the university's proactive approach to enhancing the educational experience by considering their requirements and preferences. The experts commend the University's leadership for actively meeting with students. **However, they see that the implementation of the university strategy needs more consideration of the student body at the university, faculty, and department levels.**

The expert group confirms that regular evaluations are conducted to ensure the quality of the programs. The quality management system is generally suitable for identifying weaknesses and improving the degree programs.

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

The experts thank the University for the provided statements and additional documentation concerning criterion 5.

(ASIIN 5) More consideration to the student body at the different levels– Response No. 29
The experts are pleased to learn that the University Council includes representatives from students. They also appreciate that dialogues are being implemented with the University and Faculty boards, where students can express their opinions and views. It is also positive that the programs are receiving continuous direct feedback through a dediciated email address and student surveys. However, the experts believe that student participation goes beyond simply discussing matters with students, as they need more real voices in the university boards. Therefore, the experts reiterate the recommendation and suggest the University to explore the possibility for more involvement at the University, faculty, and department levels.

The experts consider criterion 5 to be mostly fulfilled.

D Additional Documents

Before preparing their final assessment, the panel asks 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:

For all programs:

- Precise information for a uniform calculation of Vietnamese credits based on workload and consistent with the various lecturing types (lectures, self-study, lab work, exercises and assignments).
- Precise information on the conversion of Vietnamese credit points into ECTS.

Laboratories:

- HCMUS policy to warrant that safety requirements in the labs used for teaching in the four programs under review (and preferentially other programs including the Master level) are regularly checked once established regarding international standards.
- An overview of which experiments are exactly conducted in each practical course in the labs for the Biology and Biotechnology programs. Along with this, an overview of the dedicated experimental laboratory equipment for educational purposes, including quantities.
- A detailed overview demonstrating that the university possesses sufficient equipment for the basic training of all chemistry and chemical technology students, along with summaries of the specific experiments conducted in each practical session.
- A list of instruments and lab items in the teaching labs for cellular and molecular biology as well as microbiology, including the number of instruments available to students, such as pipets, photometers, PCR instruments, electrophoresis, gel documentation, and autoclave. Also, an overview of the specific practical experiments (associated with the respective courses) along with photos of these labs so the assessment team can get an impression of the equipment and lab facilities.

E Comment of the Higher Education Institution (19.06.2024)

The institution provided the following statement [the links have been deactivated]:

Criterion 1.1 Objectives and Learning Outcomes of a Degree Program (Intended Qualifications Profile) – Response No. 1

In the draft report, on **p.9, line 24**, the expert team noted "that the IPOs and ILOs, as presented in the self-assessment report for all four programs, are not available on the respective websites. They request the university to ensure consistency in the presentation of the programs and make this relevant information available to all stakeholders."

Response: The faculties ensure that all the programme-related information is easily accessible to all stakeholders in both Vietnamese and English versions. IPOs and ILOs of four study programmes are available to all stakeholders on Faculty webs as follows:

- For Chemistry programme via link: https://chemistry.hcmus.edu.vn/blog-post/5256/chuong-trinh-dao-tao-nganh-hoa-hoc-chuong-trinh-chinh-quy-chuan

- For Chemical Technology programme via link: https://chemistry.hcmus.edu.vn/blog-post/5257/chuong-trinh-dao-tao-nganh-cong-nghe-ky-thuat-hoa-hoc

- For Biology programme via link: https://fbb.hcmus.edu.vn/vn/ctdt-sinh-hoc/info.html

- For Biotechnology via link: https://fbb.hcmus.edu.vn/vn/chuong-trinh-nganh-cnsh/info.html

Criterion 1.3 (1) Curriculum- Response No. 2

On **p.13, line 7**, regarding the Chemical Technology program, the audit team pointed out "the definition of "12 semesters" may lead to a potential misunderstanding regarding the total duration of the program as 6 years. They suggest adopting the term "trimester".

Response: Thank you for the kind feedback from the audit team. "Trimester" will be used in the documents to avoid any misunderstandings among stakeholders.

Criterion 1.3 (2) Curriculum - Response No. 3

On **p.14, line 18**, it is noted that "upon reviewing the structure and content of the curricula for the four programs under review, the experts see an opportunity for the University to apply more synergies among the different programs, such as exchanging modules between Biology and Chemistry".

Response: According to the plan and strategy of the University of Science, VNU-HCM, for the period 2022-2026, by 2026, the University will complete the development of training programs for both major and minor disciplines. By 2016, all students in Chemistry, Chemical Technology, Physics and Engineering Physics, Biology and Biotechnology, Environmental Science and Technology, Materials Science and Technology, and related fields will study common courses in the general education phase.

In the 2022-2023 academic year, we held a second university-wide meeting to discuss foundational courses for related disciplines such as Chemistry-Materials Science, Biology-Biotechnology-Materials Science, Chemistry-Biology-Biotechnology, and Chemistry and Environmental Science. This is a step towards developing a curriculum framework that allows students to pursue both major and minor disciplines.

QD 389_Decisions and regulations on organizing major and minor training programmes for undergraduate students

Besides, FBB are planning to collaborate with Vietnam National University Ho Chi Minh City, University of Economics and Law to develop a new programme of Biology-Biotechnology-Economics. This decision was made at the Faculty Scientific Council meeting held on 16 June 2024. Minute of Faculty Scientific Council meeting held on 16 June 2024

Criterion 1.3 (3) Curriculum - Response No. 4

On **p.14, line 21**, the experts noted regarding the Chemistry/Chemical Technology programs, "that the curriculum has yet to integrate modern knowledge in chemistry. Therefore, they see that the programs could be expanded to include environmental topics (Green Chemistry and Life Cycle Assessment)".

Response

FCHEM: Now, the FCHEM is organized into six divisions: Organic Chemistry, Inorganic Chemistry and Applications, Physical Chemistry, Analytical Chemistry, Polymer Chemistry, and Medicinal Chemistry. Although the Faculty does not have a division specifically for Green Chemistry and Life Cycle Assessment, there are research groups working on projects in Green Chemistry and Environmental Chemistry (with students conducting their thesis research in these areas). The Green Chemistry research group consists of about six members, and each semester, around 10-12 students choose to engage in research on Green Chemistry and Chemical Synthesis Technology, such as Professor Tran Hoang Phuong, https://orcid.org/0000-0002-7319-872X. In the field of Environmental Chemistry and Environmental Analysis, the department has a group of three members researching environmental fields or catalysts for wastewater treatment applications, resulting in 3-5 scientific publications annually for example Professor Le Tien Khoa https://orcid.org/0000-0003-0058-0298 and Dr Truong Lam Son Hai https://orcid.org/0000-0003-2435-6039. These research outcomes are partly derived from students' thesis projects.

Additionally, the curriculum in FCHEM includes courses on Environmental Chemistry and Air Pollution Analysis, Water Chemistry, and Green Chemistry (each 2 credits and classified as elective courses).

The University of Science also has a Faculty of Environmental Science and Technology, which offers undergraduate programs in environmental science and technology. Feedback from the audit team serves as a basis for stakeholders to promote the development of a minor program. This program aims to provide students with the opportunity to accumulate credits and earn a minor degree in Environmental Science and Technology.

Criterion 1.3 (4) Curriculum - Response No. 5

On **p.15, line 21,** it is asserted that the experts "strongly believe that HCMUS should continue to increase the English level of the student population, and this should be consistent for all study programs".

Response: For all study programmes, there are four compulsory General English courses (English 1, English 2, English 3, and English 4). Based on Regulation 1625/QD-KHTN, students are required to complete four English courses or have an English certificate according to regulations to register for specialized courses. Please click here to find the relevant regulation. In these courses, students must participate in English conversation and presentations.

FCHEM: The enhanced English program features small class sizes (~40 students per class) and incorporates English language training from the general education phase through to core and specialized courses, culminating in the graduation project (which requires students to present their thesis orally in English with slides prepared in English). All graduation reports must include summaries in both English and Vietnamese, and the full report must be written in English for students with an IELTS score of ≥ 5.0 or an equivalent English proficiency score).

For the standard program: Due to larger class sizes (80-100 students) and varying levels of English proficiency among incoming students, the general English proficiency requirement is not as high, set at B1 (compared to B2.1 for the English-enhanced program). To help students access and improve their English skills, teaching materials (slides and exercises) and reference materials are provided in English. In the specialized phase, teaching materials, including slides and scientific articles, are in English. All students must take the Seminar (Pre-graduation) course, where they are required to read scientific articles in English and summarize their research overview (15-20 pages) for presentation to a committee. During the graduation project, students are also required to read and summarize scientific articles.

Additionally, the Faculty of Chemistry organizes monthly seminar reports, featuring speakers such as professors or researchers from abroad. Students are required to attend these seminars to enhance their reading, comprehension, and communication skills in English, and attendance is counted as extra credit in student evaluations.

The Faculty of Chemistry conducts regular English proficiency assessments once per semester. Additionally, there are English clubs, such as the BEE Club, that provide students with an environment to practice and improve English via Fanpage: https://www.facebook.com/beeclub.khtn?locale=vi_VN

The Chemistry Faculty's student association frequently organizes TOEIC mock tests, testing reading and listening skills, to assess students' English proficiency and familiarize them with various English certification exams. E.g: The 2nd 2024 TOEIC mock-test

FBB: The Faculty of Biology and Biotechnology has implemented a variety of measures to enhance the quality of its programs. One such measure is inviting lecturers from foreign universities to teach specialized courses, such as Molecular and Cellular Immunology, Molecular Diagnostics, and Plant Biotechnology. This not only improves students' professional knowledge but also provides an opportunity for them to practice their foreign language skills. In addition, the faculty actively participates in student exchange programs, both inbound and outbound, to provide students with a more global perspective.

For the English-enhanced program, the faculty provides General and Fundamental modules with documents and learning materials in English and teaches them in Vietnamese. At the specialization and graduation stage, modules are taught entirely in English. While most students in the faculty have the ability to read scientific documents and present reports in English, some still struggle with communication, leading to graduation being delayed by 1-2 semesters. To address this issue, the faculty plans to collaborate with the Foreign Language Center of the University to improve English language skills among all students, in line with the training program framework, starting from the 2024-2025 academic year. This decision was made at the Faculty Scientific Council meeting held on 16 June 2024. Minute of Faculty Scientific Council meeting held on 16 June 2024

Criterion 1.3 (5) Curriculum - Response No. 6

On **p.15, line 31**, "the university is encouraged to expand its student mobility programs".

Response:

Chemistry, Chemical Technology: FCHEM is connecting and exchanging students (sending FCHEM students to partner universities for internships of 2-3 months or to complete their graduation projects) with institutions such as National Tsinghua University (NTHU), National Taiwan University (NTU), universities in New Zealand, Umeå University, Kyoto Institute of Technology, Hiroshima University (Japan), and others. However, only about 10-15 students are sent each year due to the funding limitations of the partners. The university and FCHEM are actively expanding the network of partner universities abroad to increase student exchange programs and collaborative scientific research opportunities. https://chemistry.hcmus.edu.vn/category/hop-tac-quoc-te

Biology, Biotechnology: FBB has collaborated with numerous educational institutions in Japan, Korea, and Taiwan, and has effectively organised numerous student exchange programmes. From 2020 to 2023, approximately 12 students joined exchange programs

in Japan, Germany, Taiwan, and Singapore. The average duration of student internships is 3-4 months. In term of inbound students, there are 25 students from Tsukuba University and Jeju National University participating in 2-3 weeks exchange program at our institution. FBB Inbound-Outbound data.xlsx

In the future, FBB plans to broaden its reach by establishing new collaborations and maximising the potential of its existing academic partnerships.

Criterion 1.5 (1) Workload and Credits - Response No. 7

On **p.19, line 24,** the experts observed, concerning the credit system used for the four programs, that "to acquire credit for theoretical, practical, or experimental modules, students must spend at least 30 self-study hours. The experts noted, however, " that in a workload-based credit system, students' self-study time cannot be determined by the administration as it is the time students, on average, need to meet the requirements. So, the requirements of a course have to be adjusted until the average student's self-study time meets the intended one, or the credits have to be updated".

Response: According to Circulars 17/2021/TT-BGDDT and university academic regulations for undergraduate programmes including VNUHCM academic regulation and VNUHCM-US academic regulation, each theoretical credit or each credit of exercises and practice requires students to have 30 hours of self-study per credit. Based on the maximum allowable student workload of 40 hours per week, including both class hours and self-study hours, the university sets a maximum number of credits that students are allowed to register for each semester. For example, students can register for up to 25 credits per semester and 12-14 credits per trimester. Each theoretical credit or each credit of exercises and practice requires students to have 30 hours of self-study per credit. Based on the maximum allowable student workload of 40 hours per week, including both class hours and self-study hours, the university sets a maximum number of credits that students are allowed to register for each semester. For example, students can register for up to 25 credits per semester and 12-14 credits per trimester.

The time spent on self-studies has been evaluated via homework or seminar that lecturers assign for the student. Lecturers evaluate the efficiency of self-studies via the result of homework or seminar.

As of now, we have not had the questionnaire to survey the student's workload to make sure that student is satisfied with their own workload. We will add this point into our revised questionnaire for the upcoming survey.

Criterion 1.5 (2) Workload and Credits - Response No. 8

On **p.19, line 32,** the expert group stated that "there has not been a questionnaire to gauge students' satisfaction with their workload. To address this, the University plans to incorporate this aspect into a revised questionnaire for an upcoming survey. The audit team strongly encourages the university to verify students' workload, particularly the time allocated for self-study".

Response: Thank you for the feedback from the audit team. To make sure that students will be satisfied with their workload, the university is going to add a questionnaire related to this into the course evaluation questionnaire to conduct a student survey on workload satisfaction during this semester.

Chemical Technology:

Measurement and monitoring of self-study workload for students are regulated as follows:

For each course worth 3 credits, the structure typically consists of 2 theoretical credits and 1 exercise credit. Regarding the exercise component: students are required to attend exercise classes for 2 hours per week per credit, during which instructors will provide guidance and correction on assigned exercises. Students are also expected to study assigned materials and complete exercises at home before attending exercise classes.

For laboratory courses (worth 2 credits): there is typically one orientation session for the laboratory course and approximately 8-12 laboratory sessions per course, depending on the stage of the course. Prior to each laboratory session, students are required to study the theoretical background and instructions, complete preparatory work at home, and submit their preparations before entering the laboratory. In the laboratory, instructors summarize the content and guide students in conducting experiments. After each laboratory session (usually lasting 5 hours), students analyze the data at home and write experimental reports according to a specified format, including objectives, theoretical background, experimental procedures, results, discussion, and conclusions.

For theoretical courses: The final grade of each course typically comprises at least 3 components: progress assessment, mid-term exam, and final exam. Progress assessment includes the average score of in-class quizzes or summaries of related knowledge topics and written summary reports. To prepare for quizzes or summaries, students must study at home and complete preparatory work. Additionally, some courses utilize instructional videos, such as General Chemistry 2 (CHE00002) (https://classroom.google.com/c/NjUwNjM0MDMzMTQ2, pass code: ioe2ywh), Chromatography, Analytical Practice [***Links to various instructional videos],*** etc., where students are required to watch instructional videos at home before attending class, where instructors summarize the content and administer quizzes. To solve quizzes or exercises, students must prepare by studying materials at home, either through reading book chapters or watching instructional videos.

Biology and Biotechnology: The time spent on self-studies has been evaluated via homework or seminars that lecturers assign for the student. Lecturers evaluate the efficiency of self-studies via the result of homework or seminar.

In the Introduction to Biology/Biotechnology course, the responsible person for this course actively surveyed the students at the end of the semester about their satisfaction with the time to prepare seminar reports.

We attached the exhibit for this work here. Portfolio of Introduction to Biology/Biotechnology course

Criterion 1.5 (3) Workload and Credits - Response No. 9

On **p.20, line 9,** the assessment team also noted that "for the four programs under review, English is part of the learning outcomes but not credited. They, therefore, suggest to the University to include English proficiency in the calculation of the Grade Point Average".

Response:

Chemistry and Chemical Technology: To obtain a bachelor's degree in chemistry or chemical technology, students must meet the following requirements: accumulate the prescribed number of credits for the Chemistry major (133-137 credits) or Chemical Technology major (131 credits), fulfill the requirements for national defense education, physical education, and foreign language proficiency. For the specialized English courses (in Chemistry or Chemical technology), the grades will be factored into the students' GPA. General English proficiency, beyond the required credit hours, must be certified upon graduation, hence the reason why general English grades are not included in students' GPA calculation.

Biology and Biotechnology: To obtain a Bachelor's degree in Biology or Biotechnology, students must meet the following requirements: accumulate 131 credits, fulfill the requirements for national defense education, physical education, and foreign language proficiency. General English proficiency, beyond the required credit hours, must be certified upon graduation, hence the reason why general English grades are not included in students' GPA calculation.

Criterion 1.5 (4) Workload and Credits - Response No. 10

On **p.20, line 27**, and upon reviewing the module handbook, the audit team noted that "although there is a distinction between workload associated with supervised studies and self-study time, in many cases, the workload and credit given do not fit together. Moreover, the conversion from Vietnamese credit to ECTS is not systematically applied".

Response:

Chemistry and Chemical Technology: FCHEM reviews all courses in both training programs and standardizes the conversion of Vietnamese credits to ECTS credits according to regulation No: 1304/QĐ-KHTN/24 July 2023.

Biology and Biotechnology: According to the Circulars 17/2021/TT-BGDDT (Article 7, Section 1b) and university regulations:

- Theoretical course: one credit equals 15 lecture hours and 30 self-study hours.
- Practical course: one credit equals 30 lecture hours and 30 self-study hours.

We acknowledge the feedback from the audit team. We reviewed the module handbook to make sure that the workload and credit given fit together. The updated version of the module handbook is uploaded at FBB_Module Handbook.

FBB reviews all courses in both training programs and standardizes the conversion of Vietnamese credits to ECTS credits according to regulation No: 1304/QĐ-KHTN/24 July 2023. Please visit the link below to see the formula.

Information on the conversion of Vietnamese credit points into ECTS.

Criterion 1.5 (5) Workload and Credits - Response No. 11

On **p.20, line 32**, it is noted that "the experts were unable to verify yet whether a workload-based credit system has been established or if credits have been allocated appropriately based on workload".

Response: As per the Ministry of Education's guidelines on class hours, workload is assigned for each theoretical, practical, and exercise credit. Direct teaching hours in the classroom will be overseen in accordance with VNUHCM-US regulations. However, student self-study hours are detailed in section 8.

Criterion 2. (1) Exams: System, concept and organization - Response No. 12

On **p.25, line 15**, it is stated for the Biology/Biotechnology programs that "following discussions with the stakeholders, the expert panel recommends adopting the Bachelor's thesis as the only graduation form".

Response:

Chemistry and Chemical Technology: A Bachelor's thesis is compulsory for all students at FCHEM.

Biology and Biotechnology: As of cohort 2025, the curriculum will be updated. Students who do not choose a graduation thesis must complete the graduation project (6 credits).

Criterion 2. (2) Exams: System, concept and organization - Response No. 13

On **p.26, line 6,** the experts suggested "that the Bachelor's thesis contains an abstract in English."

Response:

Chemistry and Chemical Technology: At FCHEM, English-enhanced programs require students to write summaries in both Vietnamese and English. We acknowledge the feedback from the audit team and request the abstracts (in both Vietnamese and English) in the graduation report.

Biology and Biotechnology: An abstract in English is a compulsory part of a graduation report.

Criterion 3.2 (1) Funds and equipment – Response No. 14

On **p.29, line 20,** it is noted that **"**in terms of potential bottlenecks, the assessment team learned that when teachers utilise government funds to purchase chemicals, it often involves a lengthy procedure spanning up to three months. This delay can impede the effective functioning of teaching labs. The experts suggest that the university prioritise expediting the processing of orders for basic laboratory supplies to ensure seamless teaching operations".

Response: As per the regulations stipulated in the decree..., procurement of chemicals and equipment in public institutions funded by collected or government budgets must undergo a bidding process. This process involves the unit's submission of a proposal for the purchase of chemicals and equipment, along with the estimated price of the items. Subsequently, an online bidding announcement is made, followed by an online bidding evaluation, which typically takes 3.0-4.5 months. In the event of errors or a lack of companies meeting the chemical requirements specified in the bidding package, the package will be cancelled, and a new bidding process will commence, requiring an additional 3.0 months. The university is also enhancing the procurement process for chemicals and equipment used in practical applications.

Criterion 3.2 (2) Funds and equipment – Response No. 15

On **p.30, line 26,** the assessment team pointed out that "the inconvenience of commuting between campuses, spanning a 20-kilometer distance that takes up to 45 minutes, may represent a significant challenge for students".

Response: According to the teaching plan, standard undergraduate programs will teach theoretical and practical subjects at the Linh Trung campus. For English-enhanced programs, theoretical subjects will be taught at the Nguyen Van Cu campus. Practical subjects will still be taught at the Linh Trung campus; however, we have arranged the schedule so that students have the option to practice all day or attend practical sessions at the Linh Trung campus, allowing them flexibility in commuting. This arrangement enables students to manage their commuting time effectively. Additionally, the bus system in Ho Chi Minh City is very convenient for student transportation. There are many bus routes within the city that have their final stop at the main gate of the University of Science, campus 2 (bus routes number 6, 8, 50, 52, 53).

Criterion 3.2 (3) Funds and equipment - – Response No. 16

Furthermore, **on p.30, line 29**, it is noted that "the experts are under the impression that the size and logistics of operational activities of many labs at Campus 1 may no longer align with safety regulations. This aspect warrants the University's attention since it may impact the mindset that future generations bring to the future workplace or the set-up of new labs for institutions and industries".

Response:

Chemistry and Chemical Technology: The laboratories at the Nguyen Van Cu campus are designated for undergraduate thesis projects and research conducted by graduate

students. At the Nguyen Van Cu campus, FCHEM has approximately 45 laboratories (each 40 - 100 m2) with a capacity of 5-15 students or researchers. These laboratories are equipped with safety measures including laboratory safety regulations, safety guidelines, first aid instructions, automatic fire alarms, fire extinguishers, emergency shower units, gas masks, etc.

In the future, the university will renovate and equip the laboratories with safety standards according to either general standards or industry-specific standards.

Biology and Biotechnology: Despite the relatively limited space in the laboratories at Campus 1, they are equipped with necessary laboratory safety equipment and furnished with detailed instructions regarding laboratory safety. The module of Biosafety and Bioethics (Course ID: BIO10002) forms part of the curriculum in the Fundamental stage of education.

In the upcoming semester, it is planned that all students will attend classes for 4 years at Campus 2. The FBB's Campus 2 facilities have spacious teaching laboratories, measuring between 70-80 m2/room, with a total of 5 rooms available. These laboratories are fully equipped with safety equipment and instructions. Additionally, there are several large research laboratories at Campus 2, such as the Stem Cell Institute, Cancer Research Laboratory, and Tissue Engineering and Biomaterials Laboratory, which span 200-400 m2/ unit. These laboratories will be the location for future student studies and research. Meanwhile, Campus 1's laboratories will primarily serve postgraduate training and will not be subject to overload.

Criterion 3.2 (4) Funds and equipment- – Response No. 17

On **p.30, line 35**, the assessment team identified that "while many labs in both Faculties are modern and well equipped, it would be important to further implement international standards such as ISO, GLP, or others. This would ensure that students working in those labs can get familiar with these standards".

Response:

Chemistry and Chemical Technology: FCHEM and HCM-US acknowledge the feedback from the audit regarding the implementation of laboratory safety standards such as ISO, GLP, and other international standards, and will progressively make adjustments to meet the standards for laboratory safety.

Biology and Biotechnology: Currently, there are 2 laboratories (Stem Cell Laboratory and Tissue Engineering and Biomaterials Laboratory) of FBB that meet the international standard of ISO/GMP. FBB students are encouraged to take training programmes of international standards such as ISO, GLP, or others which are held by external units.

The core lab of FBB will be opened in August of 2024. This lab is designed based on international standards of GMP. https…

Criterion 3.2 (5) Funds and equipment - Response No. 18

On **p.31, line 2**, the audit team requested "for all study programs, an overview of which experiments are exactly conducted in each practical course in the labs and the dedicated experimental laboratory equipment for educational purposes, including quantities."

Response:

Chemistry and Chemical Technology: FCHEM has compiled lists, including laboratory exercises, teaching materials and equipment used in the training programs, a list of equipment for conducting thesis projects and research, and a list of equipment for teaching purposes.

Please visit this link:
https…

Biology and Biotechnology: The overview of which experiments are exactly conducted in each practical course in the labs are provided at this link. Experiments are exactly conducted in each practical course in the labs for the Biology and Biotechnology programs. an overview of the dedicated experimental laboratory equipment for educational purposes, including quantities.

The dedicated laboratory equipment for educational purposes comes from 2 sources: faculty and the department in charge. The list of equipment is available to access at this link. A list of instruments and lab items in the teaching labs. An overview of the specific practical experiments along with photos of these labs.

Criterion 3.2 (6) Funds and equipment – Response No. 19

On **p.31, line 5**, the assessment team noted "a clear need for renewal, especially concerning the teaching of basic chemistry techniques to students in their second or third year of study. This includes analytical weighing and titration, separation methods in inorganic chemistry, synthesis equipment in organic chemistry, multiple rotary evaporators, as well as necessary distillation apparatus (including vacuum and steam distillation). The assessors recommend providing a detailed overview demonstrating that the university possesses sufficient equipment for the basic training of all chemistry and chemical technology students, along with summaries of the specific experiments conducted in each practical session".

Response: FCHEM has compiled lists, including laboratory exercises, teaching materials and equipment used in the training programs, a list of equipment for conducting thesis projects and research, and a list of equipment for teaching purposes.

Criterion 3.2 (7) Funds and equipment - – Response No. 20

On **p.31, line 14,** the assessment team emphasised that "all laboratories must be set up to ensure more safety. Large gas cylinders should be securely fastened with straps, and all wooden cabinets and shelves should be replaced with chemically and fire-resistant materials. This applies to test tube racks in basic laboratories as well. The University must guarantee adequate filtration of all ventilation systems. In any laboratory where organic solvents are handled on a large scale, it is critical that this is done under extraction hoods.

Moreover, proper handling of potentially dangerous microorganisms, along with containment and labelling of GMOs, must also be ensured".

Response: All laboratories have laboratory regulations, firefighting equipment (fire extinguisher, laboratory fire alarm), emergency exits, gas masks, safety goggles, laboratory shoes, first aid kits, and medical guidance. Each laboratory is equipped with a Fume hood for experiments involving toxic gasses or chemical mixing with toxic gasses.

Laboratories require students to classify waste and recover waste chemicals. Before conducting experiments, students are required to attend an orientation session on laboratory safety and receive basic first-aid instructions in case of emergencies.

Please kindly visit the link below to reach out to the exhibit.
HCMUS policy to warrant that safety requirements in the labs used for teaching are regularly checked once established regarding international standards

Criterion 3.2 (8) Funds and equipment - – Response No. 21

On **p.31, line 24**, it is stated that "renovations and adjustments in both furniture and necessary equipment are warranted to accommodate pairs of students for preparative and microscopic work effectively. In addition, the assessment did not encompass inspection of facilities for cellular and molecular biology, as well as microbiology, pertinent to the biology and biotechnology study program".

Response: Please kindly visit the link below to reach out to the exhibit.

A list of instruments and lab items in the teaching labs. An overview of the specific practical experiments along with photos of these labs

Criterion 3.2 (9) Funds and equipment – Response No. 22

On **p.31, line 28**, it is emphasised that "To compete in the fields of Biology and Biotechnology on an international level, it is important to ensure that all students are familiarised with basic molecular biology techniques at least by their third year of study. These include electrophoresis, DNA extraction, PCR analyses, site-directed mutagenesis, transformation and transfection, cell lysis, protein chromatography, activity tests, and immunoblotting. Work with DNA or microorganisms must also be conducted under a clean bench for safety and sterility reasons. To document the available equipment, a list of the existing devices (including quantities) and an overview of the specific practical experiments (associated with the respective courses) are requested".

Response:

Biology and Biotechnology: The techniques and experiments have been listed according to each practical course. Please kindly visit this link to reach out the information.

FBB_A list of experiments which are exactly conducted in each practical course

In terms of specialized and modern techniques, students might have an opportunity to perform on a graduation project.

Criterion 3.2 (10) Funds and equipment - – Response No. 23

On **p.31, line 36**, the assessment team also noted that "the teaching labs on Campus 2 are situated on higher floors without elevator access, which poses challenges in transporting heavy laboratory equipment. As a possible solution, the experts suggest installing an external elevator. Additionally, it might be beneficial to have air conditioning in rooms, particularly given the hot weather conditions in Ho Chi Minh City".

Response:

Chemistry and Chemical Technology: The G building (laboratories for teaching courses in the Chemistry Faculty's training program) is equipped with specialized elevators for transporting chemicals and equipment. Images of Specialized elevators for transporting chemicals

Biology and Biotechnology: The university's older buildings, constructed in the 1980s, are primarily used for laboratories with small equipment or teaching purposes. Conversely, larger equipment is typically situated on the ground floor or in new buildings.

According to the school's plans, all classrooms at Campus 2 will be equipped with air conditioning from the upcoming semester onwards.

Criterion 3.2 (11) Funds and equipment – Response No. 24

On **p.32, line 3**, it is noted that "the experts got the overall impression that the management of different labs seems different/separated, which may not be under the same systematic management procedure. Thus, a consolidated and supportive operational team may help to improve all lab functions".

Response:

Chemistry and Chemical Technology: The laboratories of the Faculty of Chemistry teach courses of the foundational stage (5 rooms, total area of 300 square meters) and those located in the G building (5 floors, 270 - 300m2/floor) are specialized laboratories for each field: Physical Chemistry, Inorganic Chemistry, Analytical Chemistry, Organic Chemistry, Polymer Chemistry, and Medicinal Chemistry. All practical sessions adhere to the same regulations and management practices. Each department has 2-3 laboratory staff responsible for lab management, preparing chemicals and equipment for experiments, as well as providing guidance on equipment usage.

The laboratories at the Nguyen Van Cu campus are used for research and conducting thesis projects, thus they are equipped with specialized equipment for the specific research field. Laboratory management and safety measures comply with general regulations.

Equipment is shared among laboratories, and students are required to register with laboratory management and receive guidance on equipment usage before operation.

Biology and Biotechnology: The university has two laboratory systems: one under the school and one under the faculty. Laboratory safety guidelines are the same in all

systems. Despite differences in management methods, laboratories must still comply with general requirements, including those related to investment processes, management, and laboratory safety, as stipulated by the relevant regulations.

Criterion 3.2 (12) Funds and equipment – Response No. 25

On **p.33, line 17**, a concern was identified "regarding the new websites for the programs, as students would like to see a more user-friendly approach and more information displayed. Consequently, the experts recommend improving and regularly updating the digital platforms available to students to ensure optimal usability and access to relevant information".

Response: The VNUHCM-US website has both Vietnamese and English versions. For the Vietnamese version, the website provides almost all information in Vietnamese for all Vietnamese stakeholders and the information is updated via the link https://hcmus.edu.vn/ including information about admission, academics, research, alumni, cooperation, etc.

Regarding the English version website, we are reviewing, amending, and updating step by step via link https://en.hcmus.edu.vn/ to make sure that we will disseminate all the necessary information in English to all stakeholders appropriately and as soon as possible. In addition, each faculty/programme also has its own web to give more details related to each study programme. Websites are always updated, ensuring that information is always fresh and delivered promptly to all stakeholders.

Chemistry and Chemical Technology: The website https://chemistry.hcmus.edu.vn/ serves as the official communication platform of the Chemistry Faculty to stakeholders.

In addition to the website, the Chemistry Faculty also has a fanpage (https://www.facebook.com/chemusvnu), a dedicated YouTube channel (https://youtube.com/@khoahoahocaihockhtnhqghcm5398?feature=shared) and TikTok channel (https://www.tiktok.com/@chemistry_hcmus) to facilitate communication and provide the latest information to students as quickly as possible. Furthermore, each class has its own Facebook page (e.g, the 2021 intake of Chemical technology: https://www.facebook.com/groups/1277240776028428) all of which are interconnected with the department's main information platform.

The Chemistry Faculty's administrative and student support faculty regularly posts updates, announcements, and answers student inquiries on the faculty's website and communication channels.

Biology and Biotechnology: We will try our best to make the official website more user-friendly for students in the future. We also have a Facebook fanpage (https://www.facebook.com/khoashcnsh) to facilitate communication and provide the latest information to students as quickly as possible.

Criterion 4.1. (1) Module descriptions

On **p.34, line 6**, the experts asked "the program coordinators to review and publish the module handbooks for the Bachelor of Science in Biology and Bachelor of Science in Biotechnology study programs".

Response: We acknowledge the feedback from the audit regarding the publishing of module handbooks. FBB has reviewed, adjusted and published them on our website in full detail via links https://fbb.hcmus.edu.vn/vn/nganh-sinh-hoc-01/muc-tieu.html for the Biology programme and https://fbb.hcmus.edu.vn/vn/muctieucnsh.html for the Biotechnology programme.

Criterion 4.1. (2) Module descriptions

On **p.34, line 9**, the assessment team also observed that "the module handbook has to be revised and completed concerning the responsible person, and self-study hours, workload, and credit have to fit together. For the Internship and Thesis, the module description should be supplemented".

Response:

Chemistry and Chemical Technology: FCHEM has reviewed and revised the module handbooks, including the review of the credit conversion between Vietnamese credits and ECTS credits, as well as the individuals responsible for the course outlines.

Module Handbook_Chem and Chem Tech

Biology and Biotechnology: FBB has reviewed the module handbook to make sure that self-study hours, workload and credit given fit together. The updated version of the module handbooks is uploaded at FBB_Module Handbook

Criterion 4.3 Relevant rules

On **p.35, line 16**, it is noted for all programs that "that the rules and regulations provided seem to be inaccessible through the University's or Faculties' websites, thereby rendering them unavailable to relevant stakeholders. The experts highlight the importance of publishing relevant rules and regulations to ensure accessibility for all interested stakeholders".

Response:

The rules and regulations are always updated on our website for stakeholders to easily access. At the university level, each office is responsible for updating the relevant rules and regulations on their websites such as the academic regulations updated on the Website of the Academic Affairs Office via link https://hcmus.edu.vn/tag/quy-che-dao-tao/, the regulations related to examinations updated on the Website of the Educational Testing and Quality Assurance Office via link http://ktdbcl.hcmus.edu.vn/index.php/quy-d-nh, etc. In addition, the guidelines concerning academic matters, criteria for major selection, graduation theses, and graduation criteria have been documented in the

handbook and issued to each student on the enrollment's initial day. We appreciate the audit team's feedback and have published all rules and regulations, ensuring their accessibility on the faculty's website.

Criterion 5. Quality management: quality assessment and development

On **p.37, line 13,** the audit team observed for all programs that "the implementation of the university strategy needs more consideration of the student body at the university, faculty, and department levels".

Response:

Chemistry and Chemical Technology: The university develops plans and strategies based on extensive input from the faculty's staff members. Scientists and teaching staff members all have a phase to provide feedback on the university's strategy. Annually, the Faculty of Chemistry organizes meetings involving all staff members to evaluate... including providing feedback and evaluating the university's strategic plans.

The strategic planning and implementation assessment are determined by the university council. The council's composition includes representatives from students. We also have a dedicated email for students, such as hopthusvkhoahoa@hcmus.edu.vn.

Biology and Biotechnology*:* The university develops plans and implements various strategies to collect the student's opinions, including end-semester survey, graduation survey, dialogues with the university president, etc. Every year, the university organizes 02 direct dialogues between students and the university's boards about all activities: training programs, teaching, lecturers, support, etc. Students are free to express their opinions and views.

Furthermore, every year, in September or October, the faculty organizes direct dialogues between students and the faculty's boards and advisor team about all activities: training programs, teaching, lecturers, support, etc.

We have an email fbb@mso.hcmus.edu.vn that receives feedback from the students. All the comments and questions have been feedback directly to students.

For Additional Documents:

Please click here to find the additional documents as required for your kind consideration.

The experts also reviewed the following additional tables, videos and documentation that were integrated into the University's statement:

1. QD 389_Decisions and regulations on organizing major and minor training programmes for undergraduate students
2. Minute of Faculty Scientific Council meeting held on 16 June 2024

3. REGULATIONS Regarding the organization of foreign language learning, and foreign language proficiency standards
4. Minute of Faculty Scientific Council meeting held on 16 June 2024
5. FBB Inbound-Outbound data
6. Circulars 17/2021/TT-BGDDT
7. VHUHCM-US Academic Regulation on Undergraduate Level
8. Various instructional videos
9. Portfolio of Introduction to Biology/Biotechnology course
10. FBB_Module Handbook
11. Information on the conversion of Vietnamese credit points into ECTS
12. Appendix FBB Core-Lab Project
13. Video on the laboratories of the Faculty of Chemistry
14. Biology and Biotechnology program: Overview of the dedicated experimental laboratory equipment for educational purposes, including quantities.
15. Biology and Biotechnology program: Overview of the specific practical experiments along with photos of these labs
16. HCMUS policy to warrant that safety requirements in the labs used for teaching are regularly checked once established regarding international standards
17. FBB_A list of experiments which are exactly conducted in each practical course
18. Images of Specialized elevators for transporting chemicals
19. Module Handbook_Chem and Chem Tech
20. FBB_Module Handbook

F Summary: Expert recommendations (08.07.2024)

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

Degree Programme	ASIIN Seal	Subject-specific label	Maximum duration of accreditation
Bachelor Chemistry	With requirements for one year	–	30.09.2030
Bachelor Chemical Technology	With requirements for one year	–	30.09.2030
Bachelor Biology	With requirements for one year	–	30.09.2030
Bachelor Biotechnology	With requirements for one year	–	30.09.2030

Requirements

For all degree programs

A 1. (ASIIN 1.5) Ensure that the actual workload of the students is consistent with the awarded credits.

A 2. (ASIIN 1.5, 4.1) Revise the module handbooks in accordance with the indications outlined in the evaluation report.

A 3. (ASIIN 3.2) Develop an action plan, with clear milestones and timelines, for the renewal and improvement of the equipment in the teaching labs and the use of more contemporary approaches for experimental training with special focus on modern genetics.

A 4. (ASIIN 3.2) Improve safety measures in the laboratories. Laboratory cabinets, surfaces, and equipment must be chemical-resistant and fireproof. The air removed through fume hoods and clean benches must be effectively filtered. For exhaust air removed centrally through ceiling-mounted hoods, the necessary extraction capacity must be

demonstrated. Ensure that students working in these areas take additional safety precautions, such as using splash guards. Handling larger quantities of organic solvents must be done within a fume hood.

For the Bachelor Biology and Bachelor Biotechnology

A 5. (ASIIN 1.5, 4.1) Ensure that the module handbook is supplemented with the module description for the Internship and Thesis.

A 6. (ASIIN 2) Based on the discussions with the stakeholders, ensure that the Bachelor's thesis is the only graduation form.

Recommendations

For all degree programs

E 1. (ASIIN 1.3) It is recommended to apply more synergies among the different programs, such as exchanging modules between Biology and Chemistry.

E 2. (ASIIN 1.3) It is recommended to further promote and enlarge the students' academic mobility programs.

E 3. (ASIIN 1.3) It is recommended to continue increasing the students' English language proficiency and that this increase be consistent across all study programs.

E 4. (ASIIN 2) It is recommended that the Bachelor's thesis contain an abstract in English.

E 5. (ASIIN 3.2) It is recommended to ensure the rapid processing of the orders for supplies of basic laboratory work for teaching.

E 6. (ASIIN 3.2) It is recommended that the size and logistics of the operational activities of the labs at Campus 1 align with safety regulations.

E 7. (ASIIN 3.2) It is recommended to improve the teaching facilities at both campuses in terms of space and maintenance.

E 8. (ASIIN 5) It is recommended to give more consideration to the student body at the university, faculty, and department levels during the implementation of the university strategy.

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G Comment of the Technical Committees (11.09.2024)

Technical Committee 09 – Chemistry, Pharmacy (06.09.2024)

Assessment and analysis for the award of the ASIIN seal:

The TC discusses the requirements and recommendations proposed by the expert group. This concerns the review of the student workload, the revision of the module handbooks, the improvement of laboratory equipment, compliance with international safety standards in the laboratories and the final thesis. The TC discusses the procedure, in particular requirements A6. The TC emphasises that it is essential that all students carry out a compulsory final project and that there can be no exceptions here. Overall, it agrees with the proposed requirements and recommendations.

The Technical Committee 09 – Chemistry, Pharmacy recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Subject-specific label	Maximum duration of accreditation
Ma Chemistry	With requirements for one year	-	30.09.2030
PhD Chemistry	With requirements for one year	-	30.09.2030

Technical Committee 10 – Life Sciences (11.09.2024)

Assessment and analysis for the award of the ASIIN seal:

The Technical Committee discusses the requirements and recommendations proposed by the expert group. This concerns the review of the student workload, the revision of the module handbooks, the improvement of laboratory equipment, compliance with

international safety standards in the laboratories and the final thesis. The TC discusses the procedure and agrees with the proposed requirements and recommendations.

The Technical Committee 10 – Life Sciences recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Subject-specific label	Maximum duration of accreditation
Ba Biology	With requirements for one year	-	30.09.2030
Ma Biology	With requirements for one year	-	30.09.2030

Requirements

For all degree programs

A 1. (ASIIN 1.5) Ensure that the actual workload of the students is consistent with the awarded credits.

A 2. (ASIIN 1.5, 4.1) Revise the module handbooks in accordance with the indications outlined in the evaluation report.

A 3. (ASIIN 3.2) Develop an action plan, with clear milestones and timelines, for the renewal and improvement of the equipment in the teaching labs and the use of more contemporary approaches for experimental training with special focus on modern genetics.

A 4. (ASIIN 3.2) Improve safety measures in the laboratories. Laboratory cabinets, surfaces, and equipment must be chemical-resistant and fireproof. The air removed through fume hoods and clean benches must be effectively filtered. For exhaust air removed centrally through ceiling-mounted hoods, the necessary extraction capacity must be demonstrated. Ensure that students working in these areas take additional safety precautions, such as using splash guards. Handling larger quantities of organic solvents must be done within a fume hood.

For the Bachelor Biology and Bachelor Biotechnology

A 5. (ASIIN 1.5, 4.1) Ensure that the module handbook is supplemented with the module description for the Internship and Thesis.

A 6. (ASIIN 2) Based on the discussions with the stakeholders, ensure that the Bachelor's thesis is the only graduation form.

Recommendations

For all degree programs

E 1. (ASIIN 1.3) It is recommended to apply more synergies among the different programs, such as exchanging modules between Biology and Chemistry.

E 2. (ASIIN 1.3) It is recommended to further promote and enlarge the students' academic mobility programs.

E 3. (ASIIN 1.3) It is recommended to continue increasing the students' English language proficiency and that this increase be consistent across all study programs.

E 4. (ASIIN 2) It is recommended that the Bachelor's thesis contain an abstract in English.

E 5. (ASIIN 3.2) It is recommended to ensure the rapid processing of the orders for supplies of basic laboratory work for teaching.

E 6. (ASIIN 3.2) It is recommended that the size and logistics of the operational activities of the labs at Campus 1 align with safety regulations.

E 7. (ASIIN 3.2) It is recommended to improve the teaching facilities at both campuses in terms of space and maintenance.

E 8. (ASIIN 5) It is recommended to give more consideration to the student body at the university, faculty, and department levels during the implementation of the university strategy.

H Decision of the Accreditation Commission (06.12.2024)

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

The Accreditation Commission discusses the procedure and agrees to introduce changes in the proposed Requirements A2 and A4.

The Accreditation Commission revises the proposed Requirement A2 to provide a more explicit context for the condition. Additionally, the Commission amends the proposed Requirement A4 to emphasize the importance of international safety standards in the laboratories, which the programs must implement and strictly follow.

In all other aspects, the Accreditation Commission adopts the assessment from the experts and Technical Committees without any further changes.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Subject-specific label	Maximum duration of accreditation
Ba Chemistry	With requirements for one year	-	30.09.2030
Ba Chemical Technology	With requirements for one year	-	30.09.2030
Ba Biology	With requirements for one year	-	30.09.2030
Ba Biotechnology	With requirements for one year	-	30.09.2030

Requirements

For all degree programmes

A 1. (ASIIN 1.5) Ensure that the actual workload of the students is consistent with the awarded credits.

A 2. (ASIIN 1.5, 4.1) The module handbook has to be revised and completed concerning the responsible person, and self-study hours, workload, and credits have to fit together. The module descriptions need to be available to all stakeholders.

A 3. (ASIIN 3.2) Develop an action plan, with clear milestones and timelines, for the renewal and improvement of the equipment in the teaching labs and the use of more contemporary approaches for experimental training with a special focus on modern genetics.

A 4. (ASIIN 3.2) Strictly follow international safety standards in the laboratories. Laboratory cabinets, surfaces, and equipment must be chemical-resistant and fireproof. The air removed through fume hoods and clean benches must be effectively filtered. For exhaust air removed centrally through ceiling-mounted hoods, the necessary extraction capacity must be demonstrated. Ensure that students working in these areas take additional safety precautions, such as using splash guards. Handling larger quantities of organic solvents must be done within a fume hood.

For the Bachelor's degree programmes Biology and Biotechnology

A 5. (ASIIN 1.5, 4.1) Ensure that the module handbook is supplemented with the module description for the internship and thesis.

A 6. (ASIIN 2) Based on the discussions with the stakeholders, ensure that the Bachelor's Thesis is the only graduation form.

Recommendations

For all degree programmes

E 1. (ASIIN 1.3) It is recommended to apply more synergies among the different programs, such as exchanging modules between Biology and Chemistry.

E 2. (ASIIN 1.3) It is recommended to further promote and enlarge the students' academic mobility programs.

E 3. (ASIIN 1.3) It is recommended to continue increasing the students' English language proficiency and that this increase be consistent across all study programs.

E 4. (ASIIN 2) It is recommended that the Bachelor's Thesis contains an abstract in English.

E 5. (ASIIN 3.2) It is recommended to ensure the rapid processing of the orders for supplies of basic laboratory work for teaching.

E 6. (ASIIN 3.2) It is recommended that the size and logistics of the operational activities of the labs at Campus 1 align with safety regulations.

E 7. (ASIIN 3.2) It is recommended to improve the teaching facilities at both campuses in terms of space and maintenance.

E 8. (ASIIN 5) It is recommended to give more consideration to the student body at the university, faculty, and department levels during the implementation of the university strategy.

Appendix: Program Intended Learning Outcomes

According to the self-assessment report and the provided "Curriculum Documents", the following intended learning outcomes shall be achieved:

Bachelor Chemistry's Intended Learning Outcomes

ILO1	An ability to use basic knowledge of natural and social sciences as the logical/reasoning foundation to resolve practical problems in chemistry-related fields.
ILO2	An ability to integrate basic and advanced knowledge in chemistry as the logical/reasoning foundation to resolve practical problems in chemistry-related fields.
ILO3	An ability to apply in-depth knowledge in the fields of chemistry, including organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry, polymer chemistry, and medicinal chemistry.
ILO4	English or French language proficiency for general and academic purposes.
ILO5	General and chemistry-related computer fluency for social communication and work purposes.
ILO6	An ability to integrate professional knowledge and skills in chemistry-related problems.
ILO7	An ability to carry out laboratory and research work by paying attention to the safety and security of laboratory work and applying responsible scientific behavior.
ILO8	Effective thinking and scientific research skills towards an independent research capacity, and a lifelong learning attitude/ motivation towards quick adaptation and integration into the work environments after graduation.
ILO9	Cultural awareness and work ethics, civic responsibility, understanding of the laws and law-abiding attitude, and understanding of the socio-economic issues.
ILO10	An ability to organize and plan works, work independently and in a team, communicate effectively in science, participate effectively in professional activities and social communication.
ILO11	An ability to analyze and evaluate the social conditions relevant to work and the chemistry related fields.
ILO12	An ability to analyze, evaluate, design, and execute specific projects (method, manufacturing process, product, etc.).
ILO13	Be aware of social and ethical responsibility and engage in life-long learning. Having a sense of dedication to the development of society and the community.

ILO14	An ability to understand work safety, ethics, environmental issues, and policies related to the chemical field, and to be confident and honest in research and science.

Bachelor Chemical Technology's Intended Learning Outcomes

ILO1	An ability to use basic knowledge of natural and social sciences as the logical/reasoning foundation to resolve practical problems in chemical technology-related fields.
ILO2	An ability to integrate basic and advanced knowledge in chemistry and chemical technology as the logical/reasoning foundation to resolve practical problems in chemistry-related fields.
ILO3	An ability to apply in-depth knowledge in the fields of chemical technology to resolve practical problems in chemistry and chemical technology-related fields (application).
ILO4	English language proficiency for general and academic purposes.
ILO5	General and chemistry-related computer fluency for social communication and work purposes.
ILO6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use science and technology judgment to draw conclusions.
ILO7	An ability to carry out laboratory and research work by paying attention to the safety and security of laboratory work and applying responsible scientific behavior.
ILO8	An ability to use and operate technical equipment of a specialized chemical technology.
ILO9	An ability to solve science and technology problems in chemistry independently based on relevant scientific methodologies and to scientific work.
ILO10	An ability to organize and plan works, work independently and in a team, communicate effectively in science, participate effectively in professional activities and social communication.
ILO11	An ability to analyze and evaluate the social conditions relevant to work and the chemical technology-related fields.
ILO12	An ability to analyze, evaluate, and optimize chemical technology problems to carry out the processes of preparing/ synthesizing chemical materials.
ILO13	Be aware of social and ethical responsibility and engage in life-long learning. Having a sense of dedication to the development of society and the community.

ILO14	An ability to understand work safety, ethics, environmental issues, and policies related to the chemical technology field and to be confident and honest in research and science.

Bachelor Biology's Intended Learning Outcomes

ILO1	Apply the mathematical, chemical, and physical basic knowledge to advance their understanding of the major areas of biology
ILO2	Apply the social science knowledge to advance their understanding of the major areas of biology
ILO3	Apply the fundamental biological knowledge to advance their understanding of the major areas of biology
ILO4.1	Apply their advanced knowledge and skills to identify, formulate and analyze information in the area of biochemistry, genetics and molecular biology, microbiology, plant physiology, animal biology, ecology and biological resources
ILO5	Demonstrate competent problem-solving skills through the following steps: collect, summarize and analyze information, identify and define the problem, generate possible solutions, develop action plan, execute action plan, manage tasks and timelines effectively, collaborate effectively as part of a team
ILO6	Demonstrate thinking and learning skills through creativity thinking, critical thinking, systematic thinking, ability to self-study, grasp world trends and lifelong learning.
ILO7	Use English language and information technologies to search and gather scientific information effectively
ILO8	Produce scientific reports (summary, review or critique) in written and oral form effectively
ILO9	Perform simple scientific procedures and measurements in biological areas.
ILO10	Demonstrate basic biology skills in biochemical, molecular biology, microbiology, ecology, plants and animal research; basic bioinformatics skills
ILO11	Demonstrate specialized skills related to formulate, perform, analyze and evaluate results of advanced experiments in biochemistry, genetics and molecular biology, microbiology, plant physiology, animal biology, ecology and biological resources
ILO12	Demonstrate a commitment to responsibility, discipline and honesty in scientific practice
ILO13	Respect the differences of others
ILO14	Have an understanding of the history, roles and responsibilities of BSc in Biology to society, social and business contexts, regulations and legal systems related to the Biology field, and how biological products created and protected.

Bachelor Biotechnology's Intended Learning Outcomes

ILO1	Apply the mathematical, chemical, and physical basic knowledge to advance their understanding of the major areas of biology
ILO2	Apply the social science knowledge to advance their understanding of the major areas of biology
ILO3	Apply the fundamental biological knowledge to advance their understanding of the major areas of biology
ILO4.1	Apply the fundamental biotechnology knowledge in gene manipulation techniques, bioinformatics, applying statistics in research, pathogen detection methods, intellectual transfer and properties, the process of technology and machine operation
ILO4.2	Apply their advanced knowledge and skills to identify, formulate and analyze information in the area of industrial, agricultural, medical and biomaterial biotechnology
ILO5	Demonstrate competent problem-solving skills through the following steps: collect, summarize and analyze information, identify and define the problem, generate possible solutions, develop action plan, execute action plan, manage tasks and timelines effectively, collaborate effectively as part of a team
ILO6	Demonstrate thinking and learning skills through creativity thinking, critical thinking, systematic thinking, ability to self-study, grasp world trends and lifelong learning.
ILO7	Use keywords and information technologies to search and gather scientific information effectively
ILO8	Produce scientific reports (summary, review or critique) in written and oral form effectively
ILO9	Perform simple scientific procedures and measurements in biotechnology areas.
ILO10	Demonstrate basic biology and biotechnology skills in biochemical, molecular biology, microbiology, ecology, plants and animal research; basic bioinformatics skills; experimental design SKILLS
ILO11	Demonstrate specialized skills related to formulate, perform, analyze and evaluate results of advanced experiments in industrial, agricultural, medical and biomaterial biotechnology
ILO12	Demonstrate a commitment to responsibility, discipline and honesty in scientific practice
ILO13	Respect the differences of others
ILO14	Have an understanding of the history, roles and responsibilities of BSc in Biotechnology to society, social and business contexts, regulations and legal systems related to the Biotechnology field, and how biological products created and protected.