



ASIIN Seal & Euromaster® Label

Accreditation Report

Master's Degree Programmes

***National Engineering Diploma Analytical Chemistry
and Instrumentation***

***Professional Master Physico-Chemical Analysis and
Environment***

***Professional Master Cellular and Molecular Technol-
ogies in BioHealth***

***Professional Master Hygiene and Safety Applied to
Health and the Environment***

Provided by

University of Tunis El Manar, Tunisia

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A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for ¹	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) ²
Diplôme National d'Ingénieur en Chimie Analytique et Instrumentation	National Diploma in Engineering Analytical Chemistry and Instrumentation	ASIIN, Euromaster®	-	09
Master Professionnel en Analyses Physico-Chimiques et Environnement	Professional Master Physico-Chemical Analysis and Environment	ASIIN, Euromaster®	-	09
Master Professionnel en Technologies Cellulaires et Moléculaire en BioSanté	Professional Master Cellular and Molecular Technologies in BioHealth	ASIIN	-	10
Master Professionnel en Hygiène et Sécurité Appliquées à la Santé et à l'Environnement	Professional Master Hygiene and Safety Applied to Health and the Environment	ASIIN	-	10
Date of the contract: 27.01.2025 Submission of the final version of the self-assessment report: 11.06.2025 Date of the audit: 01.07. – 03.07.2025				
Expert panel: Prof. Dr. Martin Jaeger, University of Applied Sciences Niederrhein Prof. Dr. Yasmine Souissi, German University of Technology in Oman Dr. Karim Jellali, Polytechnic Institute of Advanced Sciences of Sfax Dr. Jens Meissner, BASF SE Selma Mahdhaoui, Polytechnic Institute of Advanced Sciences of Sfax				

¹ ASIIN Seal for degree programmes;

² TC: Technical Committee for the following subject areas: TC 10 – Life Sciences; TC 13 – Physics;

Representative of the ASIIN headquarter: Rainer Arnold	
Responsible decision-making committee: ASIIN Accreditation Commission	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 23.03.2023 Subject-Specific Criteria of Technical Committee 09 – Chemistry as of 29.03.2019 Subject-Specific Criteria of Technical Committee 10 – Life Sciences as of 28.06.2019	

B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF ³	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
National Diploma in Engineering Analytical Chemistry and Instrumentation	Diplôme National d'Ingénieur en Chimie Analytique et Instrumentation	-	7	Full time	No	6 semesters	180 ECTS points	annually / since academic year 1993/1994
National Diploma for Professional Master in Physico-Chemical Analysis and Environment	Diplôme National de Master Professionnel en Analyses Physico-Chimiques et Environnement	-	7	Full time	No	4 semesters	120 ECTS points	annually / since academic year 2019/2020
National Diploma for Professional Master in Cellular and Molecular Technologies in BioHealth	Diplôme National de Master Professionnel en Technologies Cellulaires et Moléculaire en BioSanté	-	7	Full time	No	4 semesters	120 ECTS points	annually / since academic year 2019/2020

³ EQF = The European Qualifications Framework for lifelong learning

B Characteristics of the Degree Programmes

a) Name	Final degree (original)	b) Areas of Specialization	c) Corresponding level of the EQF ³	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
National Diploma for Professional Master in Hygiene and Safety Applied to Health and the Environment	Diplôme National de Master Professionnel en Hygiène et Sécurité Appliquées à la Santé et à l'Environnement	-	7	Full time	No	4 semesters	120 ECTS points	annually / since academic year 2012/2013

Introduction

The University of Tunis El Manar (UTM) is a large, multidisciplinary public university established in 1987, originally under the name "University of Sciences, Techniques and Medicine of Tunis." It adopted its current name in 2000. UTM brings together some of Tunisia's oldest and most prestigious higher education and research institutions, making it a central player in the country's academic landscape.

UTM has around 29,000 students (2023/2024 academic year), and nearly 3,500 teachers, researchers and lecturers. The university is organised in four faculties: Law and Political Sciences (FDSPT), Faculty of Medicine of Tunis (FMT), Economics and Management (FSEGT), and Mathematics, Physics and Natural Sciences (FST). Additionally, UTM has nine research institutes, five doctoral schools, and two schools.

The Faculty of Mathematics, Physics, and Natural Sciences—commonly referred to as the Faculty of Sciences of Tunis (FST)—is one of the oldest and most prominent faculties at the University of Tunis El Manar. Founded in 1960, FST is situated on the El Manar campus in Tunis.

FST has an academic personnel of over 1,300 teachers and researchers and serves a large student population. The number of students is around 6,000 (2023/2024 academic year), spread over six departments: 20% Biology, 15% Chemistry, 10% Geology, 23% Computer Science, 16% Mathematics, and 16% Physics.

FST offers study programmes in a wide range of scientific and technological disciplines that are designed to meet market demands, providing advanced scientific education. FST prepares engineers and master's graduates to meet professional requirements and adapt to technological advancements both nationally and internationally. These graduates possess expertise in various technological fields, including electronics, computer science, biotechnology, telecommunications, and geology.

Summary

The experts positively notice the following aspects:

- Well established contacts to companies and institutions through the final projects, which results in good job opportunities.
- Programmes are unique in Tunisia and students are in general satisfied with the programme's content and organisation.
- Small courses and good teacher to student ratio as well as an atmosphere of cooperation and openness between teachers and students.
- High research output of the teachers and organisation of international conferences.
- Good involvement of experts from the companies and public institutions in the programmes.
- Exposure of students to visiting international professors.
- Employers are satisfied with the graduates' qualification profile.
- Involvement of students' in the university's boards.

In the following areas, the experts see room for improvement:

- There need to be module descriptions for all compulsory courses, this includes the final project and the internships in the ICPI programme. The module descriptions have to include all the required information. Additionally, it would be very useful if all the study programmes at FST would use the same template for the module descriptions.
- No credits are awarded for the first and the second internship in the ICAI programme. Additionally, these internships are not mentioned in the study plan nor are there any module descriptions for it.
- No sample Diploma Supplements, which are aligned with the European template, were submitted for the ICAI and ACPE programmes.
- The instruments in the chemistry teaching laboratories, are quite old and should be replaced. Additionally, more advanced devices should be purchased so that students can get hands-on experience with current scientific methods. Students need to conduct the experiments by themselves, just a demonstration by the teachers is not sufficient. There should be a sufficient amount of consumables and reagents available.
- Safety standards must be strictly followed in all laboratories.

- It is necessary to verify the students' total workload and to award the ECTS points accordingly. FST needs to make sure that between 25 and 30 hours are required for one ECTS point. Additionally, it needs to be made transparent, how many hours of students' workload are exactly required for one ECTS point.
- It needs to be ensured that the students' feedback is anonymous and it should be done course by course. The students need to be informed about the results of the satisfaction questionnaires. A follow-up procedure needs to be established.
- There need to be English homepages for each of the four study programmes, which include the essential information such as study plan, objectives and profile, intended learning outcomes, and module descriptions.
- Students' academic mobility is rather low and should be better promoted. The number of international cooperations and scholarships should be increased and students should be encouraged to spend some time abroad.
- It is highly useful for all teachers to know about Bloom's Taxonomy and how to correctly formulate learning outcomes.
- It would be useful to issue an official AI guideline for all students at UTM and to teach all students on correctly using AI.
- Offer more excursions/site-visits to companies so that students get a better impression where to do the internships and the final project and what the focus of the different companies is.
- The oral defense should be conducted directly after finishing the end-of-study project, some graduates had to wait up to six months before the oral defense was conducted.
- It would be very useful to offer electives in all four programmes. For example, this can be achieved by opening courses from other majors.
- It would be very useful to facilitate the communication between the hosting institutions and FST for organising the final projects.
- Establish a comprehensive digital platform for students and teachers.
- It would be useful to adjust the English translation of the name of the ICIA programme and the HSA programme.
- There is no advisory board with external stakeholders at FST.

C Expert Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Homepage UTM: <https://utm.rnu.tn>
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The experts base their assessment of the learning outcomes on the information provided in the Self-Assessment Reports of all four degree programmes under review.

For all programmes, the University of Tunis El Manar (UTM) has defined programme learning outcomes. They cover a number of general competences students should acquire in their respective degree programme. Additionally, there are the specific learning outcomes (SLO) for each degree programme, which are listed in the Self-Assessment Reports.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Life Sciences as a basis for judging whether the intended learning outcomes of the Master's degree programme Cellular and Molecular Technologies in BioHealth (CMTB) and the Master's degree programme Hygiene and Safety Applied to Health and the Environment (HSA), as defined by UTM, correspond to the competences as outlined by the SSC.

The CMTB programme is designed to equip the graduates with the necessary skills and knowledge in cellular and molecular fields related to animal and human health. The programme combines theoretical and practical training to develop competencies such as mastering experimental techniques, analysing and integrating experimental data, and adopting a systematic and critical approach to complex biological and biotechnological challenges. To this end, students learn to use theoretical and applied knowledge of scientific and particularly biological tools, to identify, and solve complex scientific problems, and to conduct

experiments in cellular and molecular biology. Additionally, they should acquire a deep knowledge of business practices, project management, and soft skills, and have the ability to communicate in a foreign language. Graduates should also be able to evaluate the importance of bibliographic references, and to effectively write and present research reports and projects. Moreover, the programme aims at enhancing the socio-professional partnership and developing graduates' entrepreneurial, managerial, digital, and communication skills to facilitate their entry into industries and institutions connected with cellular and molecular technologies. These competencies involve independence and accountability in managing both material and relational aspects, as well as in handling individual and collaborative projects. They also include fostering an entrepreneurial mindset and intercultural communication skills, along with proficiency in digital information technologies, to effectively undertake professional responsibilities, as well as evaluating the social and environmental impacts of their activities. These competencies also prepare graduates for doctoral studies and successful research careers in cellular and molecular sciences.

Graduates of the CMTB programme can pursue a wide range of job opportunities in both the public and private sectors. Their specialized knowledge in molecular mechanisms, cell biology, and laboratory techniques opens doors to roles in research, diagnostics, healthcare, biotechnology, pharmaceuticals, cosmetology, and beyond.

The HSA programme is designed to equip graduates with advanced skills and knowledge in the fields of hygiene, health, and environmental safety as required by companies and institutions in the agricultural, food, health, and environmental sectors. This includes competencies in analysing and processing biochemical, chemical and microbiological data as well communication and project management skills to be able to assume positions of responsibility in a public or private company.

HSA graduates should also be familiar with the legal requirements and standards, be able to implement a quality policy in order to carry out regular internal audits and prepare tools to assess the company's situation. Additionally, graduates should demonstrate a positive attitude towards adopting new approaches and should be able to take the initiative to realize innovative ideas. This includes the ability to work both individually and as part of a team.

The HSA programme prepares students for careers as quality project manager, hygiene officers in the agricultural and food industry, as well as health, safety, and environmental consultants.

The experts refer to the Subject-Specific Criteria (SSC) of the Technical Committee Chemistry, Pharmacy as a basis for judging whether the intended learning outcomes of the Master's degree programme Analytical Chemistry and Instrumentation (ICAI) and the Master's

degree programme Physico-Chemical Analysis and Environment (APCE) as defined by UTM, correspond to the competences as outlined by the SSC.

The ICAI programme has the goal to equip students with both theoretical knowledge and practical skills in modern analytical chemistry techniques and instrumentation. Graduates are expected to understand the theoretical foundations and operational principles of a wide range of analytical techniques, including, chromatographic, and mass spectrometric methods, as well as sample preparation procedures. In addition, they should be able to apply their knowledge to select, use, and manage appropriate analytical methods and instruments for qualitative and quantitative analysis of chemical samples, addressing real-world analytical problems. This includes critically evaluating the strengths, limitations, and suitability of various analytical techniques for specific applications, and justifying their methodological choices in both written and oral form. Moreover, ICAI graduates should be proficient in laboratory work, including teamwork, report writing, data analysis, and clear scientific communication using appropriate chemical terminology.

Additionally, they should demonstrate the ability to make informed judgments about analytical strategies, interpret experimental data, and consider alternative approaches to problem-solving in analytical chemistry. It is also important for students to develop professional ethics and social responsibility in the practice of analytical chemistry so that they can contribute meaningfully and responsibly to society through sustainable and ethical practices in their professional fields. Finally, the ICAI programme aims at promoting continuous professional development by encouraging lifelong learning and fostering professional networking with industry experts and academic peers.

The APCE programme is designed to produce specialists capable of working at the intersection of laboratory analysis, industrial production, and environmental management. Graduates are expected to acquire advanced and broad knowledge in physico-chemical analysis and environmental sciences, deepening their understanding of relevant scientific disciplines and updating their expertise to meet the needs of the job market. The APCE graduates should also master technical skills specific to careers in physico-chemical analysis and environmental fields, including the use of spectroscopic, chromatographic, electrochemical, and solid analysis methods, as well as environmental analysis and management practices. This includes applying theoretical knowledge to practical situations, demonstrating autonomy in project work and the ability to manage and execute projects independently. Moreover, they should understand and address the challenges of environmental management, including quality, hygiene, safety, pollution control, waste treatment, and sustainable development. Furthermore, APCE graduates should be able to design and carry out complex research activities, including designing studies, collecting and analysing data, and

interpreting results. This should enable them to take on responsible positions in environmental analysis laboratories, the chemical and waste recycling industries, and services related to water and air quality monitoring.

Both, the ICAI and the APCE programme focus on mastering analytical techniques, developing rigorous protocols, and applying knowledge to address complex engineering problems. They are designed to prepare graduates to work effectively in various contexts, whether in research laboratories or to work in industries, or environmental services, while adhering to quality standards and regulations. This includes professional careers as careers as engineers specializing in chemical analysis, environmental engineers, research and development engineers, project managers, and technical sales engineers. The programmes also encourage innovation and the pursuit of sustainable solutions to current environmental challenges.

Supplementing the subject-related qualification objectives, students of all degree programmes should have adequate competences in oral and written communication skills, be capable of working autonomously as well as in a team-oriented manner, be able to conduct research activities, and be capable of contributing to the field by publishing research findings or presenting at academic conferences. Furthermore, they should have trained their analytical and logical abilities, be able to apply information and communication technology, and show a social and academic attitude. Finally, students should acquire communicative and language skills and should develop a strategy for life-long learning.

Based on the Self-Assessment Reports and the discussions during the audit, the experts see that the graduates of the two chemistry programmes acquire the subject-specific competences as defined in the SSC of the Technical Committee 09 – Chemistry, Pharmacy. The experts confirm that graduates of the ICAI programme and APCE programme have deepened their knowledge in core subjects, special subjects or interdisciplinary subjects. Moreover, they have gained competences qualifying them professionally, e.g. to work as a chemist in industry or public service. This includes the ability to work in a team, to carry out independent scientific work as well as to organise and conduct complex projects in the area of chemistry. Therefore, the graduates are prepared to take on leadership responsibilities, while taking into account ethical responsibility in their decisions. Both programmes thus fulfil the requirements for the award of the European chemistry label (Euromaster®), which has also been applied for.

In summary, the experts are convinced that the intended qualification profiles of all undergraduate programmes under review allow graduates to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the goals set for them. In addition, the programmes correspond sufficiently to

the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 10 – Life Sciences (HSA, CMTB) and the SSC of the Technical Committee 09 – Chemistry, Pharmacy (ICAI, APCE).

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Reports

Preliminary assessment and analysis of the experts:

The degree programmes are mostly taught in French (90 %), which is matched by the French name of the degree programmes. While French remains the main language of instruction, English is used in specific contexts, such as English language and communication courses.

The experts confirm that the names of the APCE and CMTB programmes appropriately reflect the focus and content of the respective programme. Moreover, the English translation and the original French names of the programmes correspond with the intended aims and learning outcomes.

However, with respect to the ICPI programme, the experts suggest to either increase the engineering content in the curriculum or to adjust the English translation of the programme's title. The experts observe that currently the ICPI programme focuses on analytical chemistry but the original French title "Diplôme National d'Ingénieur en Chimie Analytique et Instrumentation" and its English translation "National Diploma in Engineering Analytical Chemistry and Instrumentation" suggests that it is an Engineering programme, but this is not reflected sufficiently in the curriculum. There is some engineering content in courses such as "Chemical Engineering" and "Industrial Processes" but from the experts' point of view either the engineering content should be increased or the English translation of the programmes title should not include "Engineering". If FST want to increase the Engineering content, it would be useful to include more engineering subjects such as process control and automation, process engineering and design, data analysis and statistics, bio process engineering, reaction technology, safety technology, as well as systems engineering. As an example, the German engineering societies propose a curriculum (180 ECTS) consisting of mathematical and physical foundations including data science (30-55 ECTS), engineering basics (35-50 ECTS), process engineering modules (30-40 ECTS), applications of engineering (10-35 ECTS), non-technical modules (5-15 ECTS), engineering and physical specialization modules (20-40 ECTS) and the final thesis + colloquium. The ICPI programme should integrate advanced analytical chemistry with core engineering principles to prepare graduates for roles in research, industry, and technology development.

With respect to the HSA programme, the experts see that the programme's focus is mainly on educating safety and quality auditors and officers in the health, food, and environmental sectors. To this end, the curriculum includes many course that deal with different aspects of management such as "Quality Control", "Plant Bioproduction Management", "Risk Management", "Hospital Waste Management", "Project Management", and "Integrated Management Systems". The experts agree with the programme's content and structure as there is obviously a high demand for the graduates and the students are also satisfied with its organisation and structure. Nevertheless, the experts suggest to make the focus on management transparent in the English translation of the programme's name.

Criterion 1.3 Curriculum

Evidence:

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

Preliminary assessment and analysis of the experts:

All four degree programmes under review are offered by the Faculty of Sciences (FST) of the University of Tunis El Manar (UTM).

Education in the four study programmes under review is mainly (90 %) conducted in French. In addition, English textbooks and publications are used and in some courses parts are offered in English, for example in communication classes.

An academic year in Tunisia lasts 10 months, from September to June. It is subdivided into two semesters. Each semester is followed by an examination period. Exams are retaken in a second exam period for students who are adjourned. The semester of an engineering programme consists of 16 week, including 15 weeks of lectures and one week for exams. The semester of a Professional Master's degree programme consists of 15 weeks, including 14 weeks of lectures and one week of exams.

The Master's degree programme Engineering Analytical Chemistry and Instrumentation (ICAI) is designed to prepare students for careers as engineers with strong expertise in analytical methods, chemical instrumentation, and their industrial and research applications.

The programme and spans three years (following a two year preparatory cycle), divided into six semesters, requiring the completion of 180 ECTS points. It includes both theoretical

and practical components. The content covers core areas such as fundamental sciences (advanced mathematics and physics), advanced analytical chemistry, instrumental analysis, and laboratory techniques. Students engage with a range of analytical methods, including spectroscopic (e.g., UV-Vis, IR, NMR), chromatographic (e.g., HPLC, GC), and electrochemical techniques, as well as sample preparation and data interpretation. The curriculum also covers topics such as instrumentation, quality assurance, and scientific communication. Practical laboratory sessions and project work are emphasized to ensure graduates gain hands-on experience and are prepared for professional roles in analytical laboratories and industry. The ICAI programme also includes mandatory internships in industrial or research settings, and a final engineering project addressing real-world analytical challenges. This underlines the programme's strong emphasis on industrial relevance, with collaborations and internships in sectors such as pharmaceuticals, environmental analysis, food safety, and materials science.

The Master's degree programme Physico-Chemical Analysis and Environment (APCE) spans four semesters, with each semester comprising 30 ECTS points. The curriculum is structured to provide both theoretical foundations and practical skills relevant to the fields of physico-chemical analysis and environmental science.

The curriculum covers topics such as spectroscopic and electrochemical analysis methods, chromatographic separation and analysis techniques, solid analysis methods, hygiene, chemical engineering and energy efficiency, atmospheric depollution and environmental management, physico-chemical analysis of materials, water and solid waste treatment, renewable energies, green chemistry, and sustainable development.

The Master's degree programme Master Cellular and Molecular Technologies in BioHealth (CMTB) is a full-time program that lasts two years, divided into four semesters, and requires the completion of 120 ECTS points. Its aim is to provide advanced theoretical and practical training in cellular and molecular biology, with a strong emphasis on health applications.

The first three semesters with 14 weeks each, feature a mix of theoretical lectures and practical training. The fourth semester includes practical training and professional integration, with an end-of-study project (ESP) lasting between 16 and 24 weeks.

The CMTB programme is composed of 50 % advanced biology content like cellular biology, molecular biology, and omics, and 50 % interdisciplinary topics applied to cellular and molecular technology, like biotechnology, bioinformatics, bioprocess, bio-health, bioengineering, and cytology. The programme also includes five personal practical workshops (PPW). Two workshops are scheduled for the first semester, one for the second semester, and two for the third semester.

Being based on undergraduate degrees in life sciences, the CMTB programme focuses on "cell" as its central subject. It prepares students for practical careers by providing advanced analytical and methodological skills in cellular technologies and their components, applied to biology and health. The programme also serves as a pathway to academic careers, including doctoral studies.

The curriculum covers core areas such as immunology, molecular biology, immunopathology, and oncogenetics, alongside technical training in cell culture, cell separation, flow cytometry, ELISA, transfection techniques, spectrofluorimetry, immunocytochemistry, and confocal microscopy. In addition, students gain hands-on experience in functional cellular analyses—such as proliferation, cytotoxicity, migration assays, and cell cycle studies—as well as molecular biology techniques like molecular cloning, PCR (classic and real-time), and bacterial transformation. The programme also addresses the evaluation of immunotherapy strategies, immunomonitoring, and validation of cell-based assays, preparing graduates for roles in research, diagnostics, and the biotechnology sector.

Overall, the CMTB programme blends coursework, laboratory modules, and project work, ensuring that graduates are equipped with both the scientific knowledge and technical skills required for professional practice in cellular and molecular bio-health fields.

The Master's degree programme Hygiene and Safety Applied to Health and the Environment (HSA) is designed to provide advanced interdisciplinary training, while combining coursework, practical sessions, and project or internship experience. The curriculum focuses on key areas such as occupational hygiene and safety, environmental risk management, prevention and control of professional hazards, ergonomics, emergency organization, and sustainability. It is a full-time program that lasts for two years, it is divided into four semesters, and requires the completion of 120 ECTS points.

The programme deals with topics such as prevention management, risk assessment, integrated systems for environment, quality and safety, food safety, toxicology, and psychosocial risk management. The programme also covers legal frameworks, organizational management, and research methodologies. Practical components such as laboratory techniques, emergency response training, and internships or professional projects are integral, ensuring graduates are equipped to assess, manage, and mitigate health and environmental risks in diverse professional settings

Semesters one to three focus on gaining advanced knowledge of scientific tools and advanced basic sciences in health and the environment, hygiene, and safety. To this end students learn to implement normative solutions applied to health and the environment, to design and implement health and environmental projects, and to manage and pilot hygiene solutions in hostile environments. During the last semester, a work placement as an end-

of-studies project (Projet de Fin d'Études) needs to be completed. The work placement helps graduates to find a suitable job in competitive labour market. In addition, being exposed to a professional environment while studying can enhance students' knowledge and skills.

The end-of-study project is guided by several documents: the Internship and Training Charter, the Internship Logbook, the Internship Quality Monitoring Guide, and the Final Internship Report Writing Guide. The internship grading criteria are detailed in "Grille d'évaluation du stage, du memoire et de la soutenance" (evaluation grid for internship, dissertation, and oral presentation).

Final projects must be defended orally. These projects are based on subjects assigned by their academic and professional supervisor and last 6 months. They culminate in an oral defense which essentially assesses the following skills: technological competencies, communication and management and self-development and innovation.

The end-of-study project is validated by a defense before a jury proposed by the supervisors and designated by the dean of the FST after advice from the department director. This jury is made up of three teachers including the academic teacher responsible for the project and the supervisor from the hosting institution.

The organisation of the end-of-study project is summarised in the following table:

End-Study Internship	
Objectives	• Internship Topic Established Between the Professional Partner and the University Instructor • Adaptation of Course Content to Professional Objectives • Enhancement of Students' Professionalism Through Immersion in the Entrepreneurial Sectors of Engineering and Cellular and Molecular Technologies in Bioscience
Organization	• Active Participation in a Professional Project within the Field, Supervised by Both a Professional Mentor and a University Instructor • The Internship Topic Will Be Decided by Mutual Agreement Between the Supervisor from the Hosting Company or Public/Private Laboratory and the University Instructor Responsible for the Student
Duration	• Full Semester 4: Approximately 880 Hours of Work
Location	• Company or Public/Private Laboratory
Report submission	• A thesis is prepared under the guidance of both university and professional mentors • The report is defended publicly before a jury consisting of three members, including the two mentors • Jury decisions are made by majority vote
Evaluation	• Continuous Assessment and Oral Defense (refer to the evaluation grid in Annex 2.3.3.5)
Credits awarded	• 30 credits

Table 1: Organisation of end-of-study project, Source: SAR UTM

In addition to the final project, ICAI students conduct two additional compulsory internships: one after the second semester and one after the fourth semester. These internships usually take four to six weeks and are conducted during the summer months in companies

or research institutes. The aim behind the internships is to develop students' technological skills as well as soft skills like communicative and entrepreneurial competencies.

However, the experts point out that no credits are awarded for the first and the second internship. Additionally, these internships are not mentioned in the study plan nor are there any module descriptions for it. This needs to be redeemed. On the other hand, it is certainly commendable that ICAI students conduct internships and this could be adopted by the other study programmes.

The students point out that FST is very supportive in finding placements for the internships and always encourages them to gain as much practical experience as possible. The experts are also generally satisfied with the practical aspects of the programmes as this can help the students to specialise in a particular field of interest and significantly improves their job opportunities.

FST has established useful guidelines for these internships and every student has one advisor at the company and one at the university to ensure that the work contributes to achieving the programme's learning outcomes. The assessment methods to evaluate this phase is comprehensive and includes a written report and a presentation of their results in front of a jury. The experts appreciate the inclusion of the company advisor as one of four jury members. The evaluation takes into account the aspects work plan, discipline, teamwork, programme implementation, and activity report.

The experts appreciate that FST has well established contacts to companies and institutions through the final projects, which results in good job opportunities for the graduates. However, the students point out during the audit that they think it would be beneficial to facilitate and smoothen the communication between FST and the hosting institutions by providing digital means of communication. Digital platforms allow for all communication such as contract negotiations, approvals, feedback, and reporting to be managed more quickly and transparently, saving time for teachers, students, and internship supervisors. In addition, relevant documents and communications are securely stored and can be easily retrieved. Moreover, it would facilitate monitoring students' progress, making it easier for FST to provide timely support and for supervisors to give constructive feedback.

The experts appreciate that the teachers in the different study programmes meet regularly (at least once a semester) to coordinate the content of the courses. This is beneficial because having a coherent study programme is a key factor in delivering high-quality education. Coordination ensures that the overall programme objectives are systematically addressed across individual courses. This avoids gaps or unnecessary overlaps in content and helps maintaining a consistent standard of education. However, while the regular coordi-

nation among teachers is commendable, it appears that some of these meetings are conducted in an informal manner, without systematic documentation. This may reduce traceability and limit the effectiveness of long-term curriculum alignment.

The experts discuss with the programme coordinators, why no electives are offered in the four degree programmes under review. They learn that UTM does not allow to offer any courses if there are less than 15 students attending them. As the number of students in the four programmes is only between 15 and 20, no electives can be offered. The experts understand this restriction and suggest to open courses from other majors and/or other departments for the students. This way, no additional courses need to be offered and students still would have choice. Offering electives in a study programme, especially in a Master's programme is highly recommendable from the experts' point of view, because it allows students to follow their personal interests beyond their core curriculum. Electives enrich a university education by offering choice, fostering personal and academic growth, and enhancing career readiness, making them a valuable component of study programmes.

During the audit, the experts notice the students use artificial intelligence (AI) in preparing for exams and in completing their assignments. However, no official guideline on the use of AI exists. As the use of artificial intelligence (AI) becomes more and more important, the experts point out that an official AI guideline would be needed and students should be introduced in correctly using AI. It is useful for a university to issue an official guideline for the use of AI, because it provides clarity, consistency, and ethical direction for students, faculty, and staff. Additionally, teaching students the correct AI use is important to give them the tools, knowledge, and mindset to thrive in a digital, AI-augmented world.

A guideline helps to define what constitutes acceptable vs. inappropriate use—e.g. when it is allowed to use AI for brainstorming vs. when it counts as plagiarism or academic misconduct. Without clear rules, students may unknowingly cross ethical lines, which supports fair assessments and prevents unintentional violations of academic honesty policies. Proper guidance ensures AI supports learning, rather than replacing critical thinking, research, or writing skills and teachers can incorporate AI meaningfully into teaching, e.g., using AI as a learning tool rather than as a shortcut. For this reason, the experts recommend issuing an official AI guideline for all students at UTM and to teach all students how to correctly use AI.

In the course of the audit, the expert learn that the University of Tunis has established the Institute for Artificial Intelligence in 2024 to advance AI research and education, to support national development goals, and to ensure the ethical and effective use of AI in Tunisia. The institute was created to expand the use of artificial intelligence across various sectors in Tunisia and to fill a gap in the Tunisian higher education system by providing specialized,

advanced training in AI, which existing universities and study programmes only partially address. FST should take advantage of the new AI Institute and establish a cooperation programme in order to train teachers and students so that they are capable of correctly using and applying AI technology.

In the discussion with the experts, the students express their wish for conducting more excursions/site-visits to companies so that they get a better impression where to do the internship and what the focus of the different companies is. Offering more site visits to companies for students is useful because this way they can experience first-hand how theoretical concepts are applied in real industry settings. Seeing professionals in action can spark new interests or confirm what career path students want to pursue and students get a clearer idea of job roles, workplace culture, and skills needed in specific sectors. In addition, direct interaction with companies can open doors to internships or job opportunities. This is especially relevant for students who are unsure about their interests.

With respect to the teaching language, which is mainly French, the experts think that it would be beneficial for the students, if the programmes included more English elements, e.g. in the form of presentations and discussions. English is the primary language of international academia, research, and many industries and English proficiency allows students to participate in global discussions and conferences, and facilitates their usage of current scientific literature, journals, and research papers, which are mostly published in English. Additionally, it helps them to pursue further academic education in Tunisia and abroad and enhances their job opportunities as many employers appreciate English proficiency.

The experts are convinced that it would be useful to offer advanced courses in data science and statistics to all Master's students. This would help students to better understand how to collect, clean, analyze, interpret, and visualize data. Additionally, skills in these areas are in high demand by the employers and are becoming more and more important as digitalisation moves forward. A strong foundation in data science and statistics enables students to adapt to new tools and methods and provides a conceptual framework that stays relevant, even as technologies change.

The experts confirm that the curricula of the four degree programmes under review are designed to comply with the respective programme's objectives and learning outcomes and they are subject to a constant revision processes. As such, the curricula are reviewed regularly and commented on by students and teachers as well as by external stakeholders such as alumni or partners from the private sector. Regular changes are made to ensure that the curricula are up to modern standards. Major changes can be implemented every four years and need to be approved by the Ministry of Higher Education and Scientific Research. Minor changes within the courses can be implemented directly by FST. Besides the

objectives and learning outcomes defined by FST itself, the curricula also take into account recommendations from industry and international standards of higher education and curricula from other universities worldwide.

In general, the experts confirm that all four study programmes under review are well designed and offer a scientific education that is unique in Tunisia. The experts gain the impression that the graduates are well prepared for entering the labour market and have good job perspectives. They stress that the students' as well as the employers are very satisfied with the programme's content and organisation.

After analysing the module descriptions and the study plans, the experts confirm that all four degree programmes under review are divided into modules and that each module is a sum of coherent teaching and learning units. All practical lab work and internships are well integrated into the curriculum and the supervision by the Faculty of Sciences guarantees for their respective quality in terms of relevance, content, and structure.

In summary, the experts confirm that the choice of modules and the structure of the curriculum ensure that the intended learning outcomes of the respective degree programme can be achieved.

International Mobility

UTM and the Faculty of Sciences, are actively engaged in promoting internationalization through bilateral agreements, Erasmus+ partnerships, and participation in international mobility and research projects such as AFRIDI.

The AFRIDI project, an acronym for the name of a tribe that lived in Tunisia from which the word Africa originated, aims to harmonize an education system with a view to developing the skills and expertise essential to achieving inclusive growth and sustainable development in Africa. This project is funded by the European Union under the Intra-Africa Academic Mobility Scheme, a programme aimed at promoting academic mobility between higher education institutions in Africa. Its main objective is to strengthen cooperation and exchanges between African institutions, in order to improve the quality of education, promote knowledge sharing and develop the skills needed for the sustainable development of the continent.

UTM collaborates with several African and European institutions in the AFRIDI project, including: Université de Perpignan Via Domitia (France), Université de Tlemcen (Algeria), Université Gaston Berger (Senegal), Université Joseph KI-ZERBO (Burkina Faso), Université de Douala (Cameroon), and Université d'Antananarivo (Madagascar). The AFRIDI project is coordinated by UTM.

The International Office of the University of Tunis El Manar is responsible for a range of tasks aimed at supporting international students and fostering global partnerships. Its main duties include assisting international students with administrative procedures such as visa applications, health insurance, and general orientation to university life. The office also reviews and processes applications from foreign students, ensuring their eligibility for enrolment in accordance with quota schemes and bilateral agreements with their countries of origin. Additionally, the International Office serves as a key contact point for administrative information, coordinates student mobility and exchange programs, and provides support throughout the students' academic journey. It also plays a role in promoting the university's interests abroad by collaborating with international institutions and managing partnerships.

The Faculty of Sciences is actively engaged in international activities and cooperations that enhance its research, teaching, and innovation capacities. It participates in European Union-funded projects, such as those under Horizon 2020 and ERA-NET, serving as a coordinator and partner in international research consortia, particularly in fields like geospatial and artificial intelligence technologies for water resources management. The faculty is also involved in initiatives to internationalize Tunisian science, including twinning projects and scientific diplomacy efforts, which aim to boost participation in European research programs and foster global scientific networks. Additionally, the faculty collaborates with universities and research institutions worldwide, facilitating joint research projects, academic exchanges, and capacity-building activities that contribute to the international visibility and competitiveness of Tunisian science.

FST signed a cooperation agreement with Hohai University's College of Environment to establish the China-Tunisia Joint Laboratory for Water Disasters and Aquatic Ecological Environment Security Regulation. This collaboration focuses on joint research, talent training, and cultural exchanges in environmental sciences, particularly water resource management and ecological security.

FST is involved in several Horizon 2020 (H2020) projects, participating in at least two major EU-funded research consortia in areas such as geosciences, environmental monitoring, and hydrogeology. For example, within the MEDSAL project, the Department of Geology contributes expertise in groundwater geochemistry, hydrogeology, and environmental modelling, collaborating with European partners.

Through a cooperation agreement with the Group of International Cooperation of Brazilian Universities (GCUB), FST engages in joint teaching and research programmes, as well as faculty and student exchanges across various scientific disciplines.

UTM, including its Faculty of Sciences, has partnerships with institutions such as Université Paris-Dauphine, University Blaise Pascal-Clermont-Ferrand II, University Paris 1 Panthéon

Sorbonne (France), Bremen University, and the Berlin School of Economics and Law (Germany). These collaborations cover a wide range of scientific and academic fields, facilitating research projects, exchanges, and joint academic initiatives.

FST participates in initiatives like the ALECSO Forum on Twinning Arab Universities, which aims to foster cooperation and twinning programs between Arab and international universities to advance scientific research, innovation, and sustainable development. The main areas of cooperation span environmental sciences, hydrogeology, geosciences, data modelling, water resource management, and broader scientific research and academic exchange. These partnerships enhance the faculty's research output, international visibility, and opportunities for student and staff mobility.

Students at the University of Tunis El Manar can have credits earned abroad recognized through a formal process that typically involves a Learning Agreement. Before the exchange or study abroad period, students must draft a Learning Agreement specifying the courses they intend to take at the host institution; this agreement must be pre-approved by both the University of Tunis El Manar and the receiving university. Upon successful completion of the approved courses, the credits or equivalent units gained abroad are recognized and counted towards the student's degree at Tunis El Manar, as described in the Learning Agreement. This process ensures that academic achievements abroad are formally integrated into the student's academic record at the home university.

UTM provides some opportunities for students to conduct internships and exchange programmes abroad. Students who take part in student exchanges through cooperation programmes can gain recognition of the acquired credits after obtaining approval from their department. The credits acquired abroad are transferable to UTM after signing a learning agreement.

However, students' academic mobility is rather low. When students go abroad, it is mostly done for conducting the final project. As the students tell the experts during the audit, they are unsure where to go, how to finance the studies, and if the credits acquired abroad will be recognised at UTM. The experts understand these problems and see that academic mobility is severely impacted by the lack of financial support. Nevertheless, it would be useful to actively encourage students to take part at long or short term academic mobility programmes. To this end, it would be useful to sign more international cooperation agreements and to offer more scholarships. Especially the Master's students should be encouraged to spend some time abroad during their studies. Experiencing another academic and educational environment helps students see their field through a different cultural and scientific lens. This broadens their understanding and also improves their job opportunities.

A good starting point for initiating more international co-operations are the personal international contacts of the faculty members and the guest lecturers. It is also possible for students and teachers to apply to international organisations like the German Academic Exchange Council (DAAD) for receiving funds for stays abroad.

In summary, the experts appreciate the effort to foster international mobility and support UTM to further pursuing this path.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Reports
- Discussions during the audit

Preliminary assessment and analysis of the experts:

In Tunisia, access to a Master's programme requires a Bachelor's degree. The Bachelor's degree spans three years, with students needing to pass each year with an average score of at least 10/20. Successful completion of the third year grants a Bachelor's degree.

Graduates holding a bachelor's degree in a relevant technological field can apply for admission to the first year of HSA Master based on their academic record and interviews

To be eligible for one of the three Professional Master's programmes (CMTB, HSA, and APCE), the Bachelor's degree must come from a relevant technological field.

The internal selection process for the Professional Master's programmes is conducted through an evaluation of application files, followed by an oral interview and a written test. During June and July each year, candidates submit their applications via the FST website by completing the online application form. After the initial submission, candidate applications are reviewed. Preadmission to the Professional Master's programmes is conducted by the Master's Committee, which consists of university officials. A score is calculated based on a pre-established grid, which is made available to interested candidates in advance. This grid considers the candidate's transcripts, credits earned, honours received (bonus points), and any repeated years (penalty points).

Pre-selected candidates are evaluated based on criteria that focus on their professional motivations and personal projects. An oral interview and a written test are conducted to assess their writing, expression, and communication skills. At each stage, students are notified via the platform of the progress of their application.

For academic years 2020, 2022 and 2023, students were allowed to apply for two masters degrees at a time, therefore the number of applications showed a marked increase compared to 2019. From 2024 onwards, the coordinators have opted for two application sessions with only one choice at each session.

The detailed numbers for the Professional Master's programmes are shown in the following tables:

	2024	2023	2022	2021	2020	2019
Submitted	197	139	250	256	280	287
Preadmission	66	39	51	80	70	56
Admission	20	15	16	18	20	20

Table 2: First-year enrolment CMTB programme, Source: SAR UTM

	2024	2023	2022	2021	2020	2019
Submitted	184	130	489	493	520	535
Accepted	20	18	17	16	18	18
Enrolled	20	14	15	13	18	18

Table 3: First-year enrolment HSA programme, Source: SAR UTM

	2024	2023	2022	2021	2020	2019
Submitted	> 300	> 300	> 300	> 300	> 300	> 300
Accepted	25	20	20	23	20	20
Enrolled	23	17	28	23	18	12

Table 4: First-year enrolment APCE programme, Source: SAR UTM

There are two different ways to get admitted to the ICAI programme, which is an engineering programme:

1. Engineering students attend two years of preparatory courses (earning 120 ECTS points), in the preparatory institutes of scientific and technical studies, culminating in a national competitive examination. Students who successfully complete the national competitive exam (Concours National) after the two-year preparatory cycle are eligible for the engineering programme. According to the scores achieved in the national exam, students are oriented to the various engineering schools. They have to receive three years of schooling. Admission is based on their ranking in that competitive exam. It is worth mentioning that at the end of the second year of the preparatory cycle, they are awarded the Diploma of Undergraduate University Studies (DEUPC: Diplôme des Etudes Universitaires de Premier Cycle). This diploma allows students to join other scientific and technical institutions.
2. Students holding a Bachelor's degree or a Master's degree, wishing to enter engineering schools can take part in the specific entry exams. It allows bachelor's graduates to enrol in the first year of engineering studies and students having finished one year of a Master's degree with success to enrol in the second year of an engineering programme.

The detailed numbers for the ICAI programme are shown in the following table:

	2024	2023	2022	2021	2020	2019
Submitted	> 1000	> 1000	> 1000	> 1000	> 1000	> 1000
Accepted	22	24	29	27	22	33
Enrolled	22	24	29	27	22	33

Table 5: First-year enrolment ICAI programme, Source: SAR UTM

The experts see that all four programmes under review receive many applications and the demand is higher than the number of available study places. However, the capacity of the programmes is quite low, only between 12 and 20 students get admitted every academic year.

Students at public universities in Tunisia do not have to pay any tuition fees. The Tunisian government also subsidizes the price of student accommodation and meals served in university restaurants.

In summary, the experts find the terms of admission to be binding and transparent.

Criterion 1.5 Work load and credits**Evidence:**

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

Preliminary assessment and analysis of the experts:

UTM applies the European Credits Transfer System (ECTS) for measuring the students' total workload. The workload includes contact hours and time for independent work.

The three Professional Master's programmes encompass 120 ECTS points, the ICAI programme 180 ECTS points. One ECTS point is equal to 25 to 30 hours of students' total workload. This is based on an official regulation by the Tunisian Ministry of Higher Education and Scientific Research:

“Un crédit correspond à un volume horaire d'enseignement direct compris entre 10 et 15 heures, en fonction de la nature de l'unité (cours magistraux, travaux dirigés, travaux pratiques, stages, projets, etc.). Le volume total de travail de l'étudiant, incluant les heures de travail personnel, est estimé entre 25 et 30 heures par crédit.”

All courses of the programmes are assigned ECTS points. Every semester comprises 30 ECTS points and every year comprises ECTS credit points. The summarised working hours per semester are shown in the following tables:

Semester	Contact Hours	Self-Study Hours	Total Workload	ECTS Points
S1	406	420	826	30
S2	406	430	836	30
S3	406	430	836	30
S4		880	880	30

Table 6: Workload CMTB programme, Source: SAR UTM

Semester	Contact Hours	Self-Study Hours	Total Workload	ECTS Points
S1	406	417	823	30
S2	406	426	832	30
S3	406	443	849	30

S4		880	880	30
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Table 7: Workload HAS programme, Source: SAR UTM

Semester	Contact Hours	Self-Study Hours	Total Workload	ECTS Points
S1	401	473	874	30
S2	315	518	833	30
S3	322	616	938	30
S4	450	450	900	30

Table 8: Workload APCE programme, Source: SAR UTM

Semester	Contact Hours	Self-Study Hours	Total Workload	ECTS Points
S1	427	427	854	30
S2	441	441	882	30
S3	434	434	868	30
S4	448	448	896	30
S5	413	413	826	30
S6	450	450	900	30

Table 9: workload ICAI programme, Source: SAR UTM

According to the national regulations, each ECTS point should correspond to 25 - 30 of students' working hours. However, in the degree programmes this range is not always respected. Additionally, one ECTS point corresponds to even different numbers of working hours. For example, in the ICAI and APCE programmes for several courses just one ECTS point is awarded, but according to the respective module description and the study plans, for these course the students' total workload is 42 hours. This is clearly out of the range of the possible 25 to 30 hours and, therefore, not aligned with the official regulations.

The experts point out that UTM should follow the ECTS Users' Guide to determine the students' total workload. As described in the ECTS Users' Guide, the estimation of students' workload should include all learning activities. This is the time students typically need to complete all learning activities (such as lectures, seminars, projects, practical work, self-study and examinations). In other words, a seminar and a lecture may require the same number of contact hours, but one may require significantly greater workload than the other because of differing amounts of independent preparation by students.

Since workload is an estimation of the average time spent by students to achieve the expected learning outcomes, the actual time spent by an individual student may differ from this estimate. Individual students differ: some progress more quickly, while others progress more slowly. Therefore, the workload estimate should be based on the time an “average student” spends on self-studies and preparation for classes and exams. The initial estimation should then be verified via students’ satisfaction questionnaires.

Since the workload of the students was only estimated by the programme coordinators, the experts ask UTM to verify the students’ total workload and to adjust the awarded ECTS points. This could e.g. be done by including a respective question in the satisfaction questionnaires. In any case, UTM must make sure that the actual workload of the students and the awarded ECTS credits correspond with each other and make that information transparent in the module descriptions and the study plans. Additionally, it is necessary to make transparent how many hours of students’ workload are exactly required for one ECTS point.

In summary, the experts conclude that the total work load of the degree programmes is adequate and that there is no structural pressure on the quality of teaching and the level of education due to the work load. The students express their general satisfaction with the amount and the distribution of their work load. The estimated time budget is realistic, and the students can usually complete the respective degree programme without exceeding the standard study period.

Criterion 1.6 Didactic and Teaching Methodology
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Evidence:

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

Preliminary assessment and analysis of the experts:

During the classes, active and interactive teaching methods (e.g. lectures, discussions, reports, presentations, and group work) are applied. UTM wants to encourage the students to gain knowledge from different scientific areas and wants them to be able to solve specific problems through an interdisciplinary approach. This should ultimately contribute to the transition from a teacher-centered to a student-oriented teaching method. In order to involve all students in the learning process and to develop their thinking and analytical

skills, the teaching staff uses several methods of training and gives assignments on different levels of complexity.

Since the content to be taught is very diverse among the subjects in the Master's programmes, the activities carried out during contact hours are not uniform among the courses. In addition to traditional lectures, contact activities include other activities such as seminars and visits to companies or industrial facilities.

At Master's level, students conduct more individual scientific research. In general, the following teaching methods are used in the degree programmes: lectures, seminars, laboratory classes, internships, small group activities, and final project.

With individual or group assignments, such as discussions, presentations, or written tasks, students are expected to improve their academic as well as their soft skills. Laboratory work covers laboratory preparation, pre- or post-tests, laboratory exercises, reports, discussions, and presentations. In addition, practical activities should enable students to become acquainted with academic research methods. To this end, in most courses didactic methods such as cooperative learning, case studies, and project-based learning are applied. In general, the focus in the degree programmes is on self-organised learning and research-oriented teaching and learning methods.

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

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

The experts appreciate that FST will revise the ICAI study plan in order to introduce modules that are more suitable and more appropriate to engineering studies. The revised programme will integrate additional engineering-oriented subjects such as process control and automation, process engineering and design, data analysis and statistics, bioprocess engineering, reaction technology, safety technology, and systems engineering, in order to better reflect the engineering profile of the programme. This revised programme will be submitted to the General Directorate of Technological Studies of our Ministry for approval.

For the HSA programme, a change of the English translation of the programme's name will be submitted to the Ministry of Higher Education and Scientific Research for approval. The new name "Management of Quality, Hygiene, Safety and Environment" make the focus on management more transparent. The experts approve of this suggestion.

With respect to offering advanced courses in data science and statistics to all Master's students, FST explains that students in Biology already have courses in Bioinformatics and Data Analysis. In these courses, they learn to access and work with databases related to health, genomics, proteomics, and transcriptomics. These learning activities are included in the study plans of the HSA and TCMB programmes. While the inclusion of Bioinformatics and Data Analysis courses is commendable, it is important that the specific learning activities — such as accessing and working with databases related to health, genomics, proteomics, and transcriptomics — are explicitly reflected in the module descriptions and learning outcomes. This will ensure clarity for all stakeholders and provide transparent evidence of the competences students are expected to acquire.

The experts point out that they are convinced that it would be beneficial for all Master's students to attend advanced courses in data science and statistics (at least as electives) as these areas get more and more important in natural sciences.

The experts support the plan to offer at least three electives starting from the 2025–2026 academic year. These modules will be submitted for approval by the FST Scientific Council at the beginning of September 2025. Once approved, they will be implemented in the study plans and published for students.

The experts appreciate that FST will revise the ICAI and allocate credits to the internships. This updated study plan will be submitted to the Ministry of Higher Education and Scientific Research for approval. In a similar way, the experts support the efforts to strengthen visits to industrial sites, allowing students to better immerse themselves in the professional world and learn about company requirements after graduation.

From the experts' point of view, it is certainly useful that UTM, in collaboration with its institutions notably FST, is preparing an official AI usage charter and guidelines for teaching and learning. These will include training modules for students and staff, ensuring that AI tools are used responsibly, ethically, and effectively.

The experts acknowledge that FST has implemented a communication system for meetings with the hosting institutions. This system will be applied starting from the 2025–2026 academic year.

With respect to academic mobility, the experts see that FST provides mobility scholarships within the framework of the ERASMUS programme. Additionally, the Ministry of Higher

Education also offers annual scholarships for internships for engineering cycle students. They point out that opportunities for academic mobility exist, but they should be further promoted and expanded.

The experts thank FST for adding that the Department of Biology is involved in the Psy-CoMed Marie Skłodowska- Curie Actions (MSCA) Staff Exchange (SE) HORIZON-2021-SE-01 under the grant agreement N°101086247project, TNE neurobrige which supports staff exchanges and student mobility. FST also participates in ERASMUS ICM/+ programmes in the fields of environment, health, and mathematics (ERASMUS/ICM+ FROUNE01).

The experts acknowledge that FST will correct the study plans to align credits with the students' actual workload, ensuring that 1 ECTS point represents between 25 and 30 hours of students' work. A transparent methodology, including workload surveys and teaching activity logs, will be introduced to make this alignment explicit. A formal request has been sent to the Ministry to authorize the revised plans. The experts expect to receive verification of the corrected study plans in the further course of the accreditation procedure. FST's initiative to correct the study plans and align credits with the actual workload is appreciated, and the introduction of workload surveys and teaching activity logs represents a positive step towards transparency. However, it will be necessary to verify the effective implementation of these measures once the revised study plans are formally approved by the Ministry. Documented evidence of the applied methodology and confirmation that 1 ECTS point corresponds to 25–30 hours of student workload must be provided to ensure full compliance.

The experts consider criterion 1 to be partially fulfilled.

2. Exams: System, concept and organisation

Evidence:

- Self-Assessment Reports
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

Final exams at the University of Tunis El Manar are typically organised at the end of each semester, with students also assessed through continuous assessment.

Exams are organized in a main session, with dates and durations set by the administration at the start of the academic year, upon validation by the Scientific Council. An exam schedule is published at least two weeks before the exams begin. A make-up exam is scheduled at least one week and at most four weeks after the main session results are announced.

Continuous assessment refers to continuous evaluations based on assignments, tests, and practical work throughout the semester. This includes for example: scientific reports, literature reviews, research mini-projects, protocols, and essays on a given topic.

Practical work is assessed at each session and according to an assessment grid, which includes the mark for each piece of practical work according to specific criteria (between 30% and 50% of the final grade), and the grade for the final examination (between 50% and 70% of the final grade). Internships and practical work placements are assessed following a public defense, before a jury comprising at least two teachers in the speciality.

Each course module is graded on a scale from 0 to 20. A student passes a module with a minimum average grade of 10/20. Students who fail a module are entitled to a re-sit examination (catch-up session), typically held at the end of the academic year or semester.

The grading scheme is depicted in the following table:

Grade (out of 20)	US Equivalent Grade	Description
18 - 20	Excellent A	rare, exceptional performance
16 – 17.9	Very Good B	strong academic performance
14 – 15.9	Good C	above average
12 – 13.9	Satisfactory D	meets requirements
10 – 11.9	Pass E	barely sufficient
0 – 9.9	Fail F	insufficient performance

Table 10: Grading Scheme, Source: SAR UTM

Students have the right to request a re-evaluation of their exam script or final project under a formal appeal procedure, which must be submitted within a fixed deadline after grades are published. Appeals are handled by an academic committee that reviews the request and ensures grading transparency and fairness. The process involves input from students, administrative staff, and lecturers. However, there is no clear indication of the committee's composition, although students generally express their satisfaction with the procedure and the outcomes.

After the catch-up session and having obtained 60 credits and a 10/20 general average, the student is declared admitted to the higher year. Students may only repeat a year once during their studies at FST.

As part of the on-site visit, the experts also inspect exemplary examinations as well as samples of final projects from all four degree programmes. Overall, they are satisfied with the quality of the examinations and projects.

During the discussion with the experts, students mention that in some cases, students had to wait up to six months after finishing the end-of-study project before the oral defense was conducted. The experts emphasise that the oral defense should be conducted directly after finishing the end-of-study project, because immediate defense allows faster completion of graduation requirements. Delays between the oral defense and the end of the final project lead to unnecessary delays for the students' graduation and will cause problems for them to apply for jobs or further academic studies.

In summary, the experts confirm that the different forms of examination used are competence-oriented and are suitable overall for verifying the achievement of the intended learning outcomes as specified in the respective module descriptions. The form of examination is determined individually for each course and published in the respective module description. The forms of examination are based on the main content of the modules and the level is appropriate for the respective degree programme.

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

The experts thank FST for explaining that the oral defense is conducted in accordance with the regulations. Generally, the period between approval and defense ranges from 3 weeks to 2 months, depending on the number of documents to be reviewed. The experts see that there is an official regulation and a maximum of two months seems appropriate. However, students pointed out that in some cases graduation was significantly delayed and FST should find out for what reasons this happened and implement appropriate measures to solve this problem.

The issue raised here is not related to delays in the official defense schedule. Rather, as highlighted by an international student, the real problem was that after receiving her Master's thesis topic, she had to wait six months for the delivery of reagents. This points to a challenge of resource planning, in particular, the insufficient anticipation of critical inputs such as reagents, which results in poor planning of the research project itself and its required resources.

The experts consider criterion 2 to be mostly fulfilled.

3. Resources

Criterion 3.1 Staff and Development

Evidence:

- Self-Assessment Reports
- Staff CV's
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the experts:

At UTM, the academic staff members have different academic positions. There are professors, associate professors, assistant professors, and assistants. A doctoral degree and at least eight years of university education are required to be recruited by The Tunisian Ministry of Higher Education and Scientific Research (MESRS). Holders of a research Master's degree can be recruited as "Assistants" meanwhile they have to finish the Doctorate. A Doctorate is required to recruit "Senior Lecturers" and "Professors". Permanent higher education teachers are recruited through a competitive selection process held by MESRS. The candidate's accomplishments and curriculum vitae are evaluated in addition to an admission interview by a national recruitment jury.

Open positions are announced by FST to UTM's administration, which forwards them, after approval to the Ministry of Higher Education and Scientific Research. MESRS then assigns the best candidates from the national selection process to the vacant positions.

UTM can directly hire non-permanent staff members (adjunct professors, exerts, visiting professors) who teach up to 6 hours per week.

The number of permanent staff members at FST is shown in the following table:

Academic Year	2023-2024
Assistant	5
Assistant Professor	227
Associate Professor	57
Full Professor	124

Table 11: Academic Staff Members at FST, Source: SAR UTM

The experts see that the teaching staff demonstrates strong academic and scientific credentials. Most are qualified professors in relevant fields such as biology, biochemistry,

chemistry, immunology, and health sciences, with many holding PhDs from renowned international institutions. Their active involvement in nationally and internationally funded research projects (e.g., Horizon 2020, PHC-Utique) and a solid record of publications reflects high scientific productivity. Moreover, many staff members contribute to quality assurance processes (e.g., ISO 21001 certification, PAQ-DGSE and PAQ-COCO initiatives) and curriculum development.

The general framework for academic promotion at public universities in Tunisia states that key criteria for promotion are teaching excellence and research output. Teaching excellence needs to be demonstrated by effectiveness in teaching, curriculum development, and students' mentorship. Research output includes significant scholarly contributions, such as publications in peer-reviewed journals, conference presentations, and research projects.

These core areas are consistent with international standards for academic promotion, where candidates are evaluated on their achievements and impact in teaching, research, and services.

During the audit, the experts inquire if the teaching load is appropriate and if enough opportunities are offered to the academic staff members to conduct research activities. The members of the teaching staff confirm during the audit that their teaching load is appropriate and leaves them enough time for conducting research activities. The experts approve of the high research output of the teacher's at FST and that international conferences are organised by FST.

The experts appreciate that there is fruitful involvement of experts from the companies and public institutions in the programmes and that students have regular contact with visiting international professors.

In summary, the experts confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining all four degree programmes under review.

Staff Development

The University of Tunis El Manar actively participates in international academic partnerships, offering teachers opportunities for stays abroad at universities in Europe, Africa, and beyond. This allows faculty members to experience different teaching methods, co-teach with international colleagues, and expand their academic perspectives.

Notable collaborations include joint research projects, co-organization of scientific conferences, and participation in specialized training workshops—such as those with the University of Montreal and the Group of International Cooperation of Brazilian Universities (GCUB).

Teachers can also participate in short-term exchange visits to institutions in other countries, especially those that have adopted innovative educational methods. These visits are designed for mutual learning and sharing of best practices, enhancing both teaching and research skills.

Additionally, UTM regularly organises and hosts workshops, such as a recent three-day event on cybercrime, which bring together international experts and local faculty to share knowledge and best practices. UTM also offers trainings and workshops focused on quality standards for administrative staff and teachers, which are designed to contribute to improving teaching quality and didactic skills. Some university staff, including teachers, have participated in training programmes to develop soft skills such as effective communication, leadership, and time management, which are essential for professional and personal development.

In general, the teachers are satisfied with the existing opportunities and the available financial support. Even taking a sabbatical is possible, but teachers have to apply to MESRS for its approval.

In summary, the experts confirm that UTM offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further developing their professional and teaching skills.

Student Support

There is the newly established “Career and Skills Certification Center”, and currently FST has 15 active clubs, including new ones like the theatre club, established in the 2018-2019 academic year, reflecting the institution's commitment to encouraging associative activities.

The administration offers substantial logistical and financial support, allowing students to engage in various scientific and cultural activities. Each club is led by a student and has a designated faculty tutor. A general coordinator supervises all club activities and is also part of the steering committee to ensure proper coordination.

In addition, UTM has the Health Center, which was established in 2018 and which provides free healthcare services to students and teachers. The center is staffed with numerous general practitioners, a psychiatrist, a marriage counsellor, a social worker, a gynaecologist, and nurses. In recent years, concrete actions have been taken to raise student awareness of the services offered at the Health Center.

The members of the teaching staff are available on any issues regarding the degree programmes and offer advice on particular courses, as well as on required papers or reports.

The expert group notes approvingly an atmosphere of cooperation between teachers and students.

The experts underline that it would be very useful, if UTM would provide a comprehensive digital platform for teachers and students. A comprehensive digital platform is essential for modern universities to remain competitive, efficient, and responsive to the needs of students, faculty, and administration. It allows for consolidating announcements, resources, and communications, reducing confusion and ensuring everyone stays informed. Additionally it enables real-time collaboration among students and teachers because course material can be directly accessed and modern learning and teaching methods can be introduced.

Finally, the experts notice positively that the study programmes have small courses, which results in a good teacher to student ratio as well as an atmosphere of co-operation and openness between teachers and students.

Criterion 3.2 Funds and equipment

Evidence:

- Self-Assessment Reports
- Visitation of the facilities
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The four programmes under review receive financial support from four sources:

- i) State budget allocated by the MESRS in consultation with UTM. This includes payments for staff members, laboratory operation, scientific, social, cultural, and sports activities.
- ii) FST's budget from student registration fees for undergraduate, master's, and doctoral programmes, as well as revenue from canteen rentals.
- iii) Funding from partnerships and research projects.
- iv) Fees from occasional services provided to private laboratories and companies.

In addition to 10 Shared Research Service Units (USCR), FST has 44 research laboratories representing the different research areas across the departments.

In the Biology Department, there are the following research laboratories:

1. Molecular Genetics, Immunology, and Biotechnology (Génétique Moléculaire, Immunologie et Biotechnologie)

2. Mycology, Pathologies, and Biomarkers (Mycologie, Pathologies et Bio-Marqueurs)
3. Neurophysiology, Cellular Pathophysiology, and Biomolecular Valorization (Neurophysiologie, Physiopathologie Cellulaire et Valorisation des Biomolécules)
4. Microorganisms and Active Biomolecules (Microorganismes et Biomolécules Actives)
5. Ecology, Biology, and Physiology of Aquatic Organisms (Ecologie, Biologie et Physiologie des Organismes Aquatiques)
6. Biochemistry and Technobiology (Biochimie et Technobiologie)
7. Plant Productivity and Environmental Constraints (Productivité Végétale et Contraintes Environnementales)
8. Biodiversity, Parasitology, and Ecology of Aquatic Ecosystems (Biodiversité, Parasitologie et Écologie des Écosystèmes Aquatiques)
9. Diversity, Management, and Conservation of Biological Systems (Diversité, Gestion et Conservation des Systèmes Biologiques)
10. Plant-Soil and Environmental Interactions (Interactions Plantes Sol Et Environnement)
11. Biodiversity, Biotechnology, and Climate Change (Biodiversité, Biotechnologies et Changements Climatiques)
12. Genetics, Immunology, and Human Pathologies (Génétique, Immunologie et Pathologies Humaines)

In the Chemistry Department, there are the following research laboratories:

1. Materials Chemistry and Catalysis (Chimie des Matériaux et Catalyse)
2. Analytical Chemistry and Electrochemistry (Chimie Analytique et Electrochimie)
3. Structural Organic Chemistry: Synthesis and Physicochemical Studies (Chimie Organique Structurale: Synthèse et Etudes Physico-Chimiques)
4. Materials, Crystal Chemistry, and Applied Thermodynamics (Matériaux, Cristallographie et Thermodynamique Appliquée)
5. Applied Mineral Chemistry (Chimie Minérale Appliquée)
6. Characterization, Applications, and Modeling of Materials (Caractérisation, Applications et Modélisation de Matériaux)
7. Desalination and Water Treatment (Dessalement et Traitement des Eaux)

8. Selective and Heterocyclic Organic Synthesis: Evaluation of Biological Activity (Synthèse Organique Sélective et Hétérocyclique: Évaluation de l'Activité Biologique)

In addition, there are 12 teaching laboratories in the Department of Chemistry; in the Department of Biology there are five teaching laboratories, which are used for the HSA and CMTB programmes.

During the on-site visit, the experts observe that there is room for improvement with respect to the visited laboratories in the Department of Chemistry. The teaching laboratories are in dire need of improvement. This concerns the outdated instruments as well as the insufficient infrastructure. The research laboratories in the Department of Chemistry are equipped with the necessary basic equipment as well as with some advanced and modern laboratory equipment, but there are a number of outdated instruments and the working space is very limited. For an adequate training, and especially for Master's students and teachers to carry out research activities, it is necessary to adapt the technical equipment in the laboratories to today's standards. Modern chemistry laboratories would enrich the students' learning experience by providing them with hands-on exposure to current technologies, which is essential for developing their skills and for their preparedness for the job market. Therefore, allocating funds for equipment upgrades is an essential step towards enhancing the educational and research capabilities of the ICAI and APCE programmes. This impression is confirmed by both the students and the teachers, who, in conversation with the experts, assess that the chemistry laboratories need to be improved. The experts emphasise that it is necessary to renovate the teaching laboratories and to purchase more modern technical equipment for the Department of Chemistry. The expert group understands that modern equipment for sophisticated laboratory work, sufficient in terms of quality and quantity, is not readily available and that the funds are limited. For this reason, the experts expect UTM to provide a concept, a reliable financial plan, and a timetable for stepwise increasing and upgrading the technical equipment used for teaching, education and research in the chemistry laboratories.

In addition, the experts critically remark that the budget for consumables and reagents for the laboratory experiments should be increased, so that all the experiments can be carried out as planned.

On the other hand, the experts see that biology laboratories provide an adequate infrastructure with very well maintained and modern technical equipment, especially in the teaching laboratories for the Master's programmes. These laboratories were renovated and updated with funds from the PAQ programme (Programme d'Appui à la Qualité) and are sufficient for the needs of up-to-date biology education. The laboratories are modern

and spacious and give sufficient room to work in small groups. Overall the equipment is very suitable and in excellent condition.

A critical point from the experts' point of view is the fact that none of the visited laboratories in the Faculty of Sciences follows international safety standards. The experts point out that the basic personal protective equipment that needs to be available to all persons working in laboratories includes safety goggles, laboratory coats, and hand gloves. It should be worn when working in the laboratory with biological samples and chemicals and when conducting experiments. Students should be trained in the right use of the equipment (e.g. the need to change contaminated gloves before touching a door handle or a keyboard, which also might be used by persons not wearing safety gloves). The personal protective equipment should be stored separately from street clothes, which cannot be stored within the labs. In addition, working safety hoods should be available in all labs (with exhaust to the outside) and chemicals and solvent containers should be labeled properly and be stored in special lockers (also correctly labeled) with exhausts leading outside the labs. Moreover, there should be emergency exit signs and posters with the safety regulations. Gas containers must not be left unsecured in the laboratory, laboratory table surfaces should be acid and solvent resistant, eye-washers need to be available in every laboratory, and safety showers need to be installed near all laboratories, ideally above the door. Solvent waste containers require grounding. A posted waste management concept would be recommended. Finally, it is important that all students know how sterile work in a laboratory is conducted and that at least once year a safety inspection of the laboratories is done and documented.

The experts stress that there are many hazardous substances and instruments used in the laboratories, which might cause a significant risk of accidents and presents a danger to human health, and the environment. This demands care in order to protect human health, conserve the environment and to prevent laboratory accidents. As a consequence, UTM needs to make sure that the internationally accepted safety standards are strictly followed in all laboratories. As part of this, UTM is asked to set up a safety (health, safety & environment) organisation to supervise and audit the adherence to safety rules in accordance with governmental regulations and international standards. Strengthening systematic safety protocols will align with best practices, ensure compliance with regulatory standards and also significantly support a safe and compliant working environment that protects both students and staff health and supports operational efficiency.

During the audit, the students express their satisfaction with the available scientific literature and the library. Remote access via VPN is possible and UTM offers access to several scientific digital databases, so that teachers and students can access current scientific publications and e-books.

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

FST adds in its statement that a bioinformatics laboratory, which was not visited during the on-site visit by the ASIIN experts, is also available and used for both the HSA and TCMB programmes in the Department of Biology. Overall, the Department of Biology offers six teaching laboratories that support practical training and research activities for students enrolled in these programmes. In addition, the Department of Biology has twelve other laboratories primarily dedicated to undergraduate students.

The experts appreciate that FST is fully aware of the immediate need to improve the facilities and the technical equipment, especially in the Department of Chemistry. They understand that not all requests by FST can be fulfilled and that there are financial restrictions. For that reason, they just expect that FST submits a concept and a timetable on how to update the instruments and how to renovate the laboratories in the Department of Chemistry within the accreditation period.

FST demonstrates awareness of the challenges related to outdated equipment and has taken proactive steps by issuing tenders to upgrade facilities. However, the repeated procedural obstacles and financial fluctuations that have prevented successful completion of these tenders highlight the need for a more resilient procurement strategy. Beyond allocating additional budget, it would be important to establish contingency planning mechanisms that anticipate currency fluctuations and procedural hurdles, ensuring that equipment acquisition is not indefinitely delayed. Clear evidence of successfully finalized tenders and actual acquisition of modern equipment will be critical for confirming progress and demonstrating tangible improvements in teaching and research infrastructure.

The experts are glad that strict adherence to laboratory safety standards is a top priority for FST. They expect that this will be ensured in all laboratories and FST needs to provide verification of the improvements in the further course of the accreditation procedure. FST should present concrete evidence of implemented safety measures in the laboratories — such as documented safety protocols, risk assessments, staff/student training records, and regular safety audits — to demonstrate that safety standards are already effectively applied. A clear strategy for continuous monitoring and improvement of laboratory safety would further strengthen this commitment.

The experts support the efforts of implementing a new pedagogical platform for all of UTM, including FST, as part of the new information system project.

The experts consider criterion 4 to be partially fulfilled.

4. Transparency and documentation

Criterion 4.1 Module descriptions

Evidence:

- Self-Assessment Reports
- Module descriptions

Preliminary assessment and analysis of the experts:

After studying the module descriptions, experts observe that the module descriptions do not include all necessary information. They point out that it would be very useful if all the study programmes at FST would use the same template for the module descriptions. Additionally, it is necessary that the module descriptions include all the required information: module title, name of teacher, number of awarded credits, students' total workload in hours per semester, prerequisites, intended learning outcomes, content, teaching methods, assessment methods, and reading list.

In general, the experts underline out that the module handbooks need to be complete and that there needs to be a module description for all compulsory courses. Currently, several module descriptions are missing, e.g. for the internships in the ICAI programme and for the final project in all four study programmes. Additionally, the module descriptions should be linked with the respective study plan on the programmes' homepages. It would be desirable to publish on the university website the programmes in English and French for international and internal use. Moreover, the workload calculation needs to be checked as there are several miscalculations and inconsistencies.

Finally, the experts point out that it is highly useful for all teachers to know about Bloom's Taxonomy and how to correctly formulate learning outcomes because these tools fundamentally enhance the quality, clarity, and effectiveness of teaching and learning. Bloom's Taxonomy provides a hierarchical framework for classifying competencies, which helps to design courses and to guide students through progressively complex levels of thinking and understanding. Well-formulated learning outcomes and using internationally recognised standards, e.g. from Bloom's Taxonomy, ensure that learning outcomes are adequate and comparable.

Criterion 4.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Reports
- Sample Degree Certificate for each degree programme
- Sample Diploma Supplement for HSA and CMTB programmes

Preliminary assessment and analysis of the experts:

The experts confirm that the students of the four programmes under review receive a Diploma Certificate. Sample Diploma Supplements were only submitted for the HSA and CMTB programmes.

The Diploma Supplement should follow the internationally recognised European template and should inform about the structure and content of the respective degree programme. Additionally, it should provide information about the individual performance as well as statistical data regarding the final grade, and includes information about the composition of the final grade according to the ECTS-Users' guide. This allows the reader to categorise the individual result. A programme specific Diploma Supplement needs to be issued automatically to all graduates.

The experts ask UTM to submit a sample Diploma Supplement, which is aligned with the European template, for the ICAI and the APCE programmes.

Criterion 4.3 Relevant rules

Evidence:

- Self-Assessment Reports
- All relevant regulations as published on the university's webpage

Preliminary assessment and analysis of the experts:

The experts confirm that the rights and duties of both UTM and the students are clearly defined and binding. All rules and regulations are published on the university's website and the students receive the course material at the beginning of each semester. However, the experts point out that currently there are no homepages for the programmes. As it is important that all stakeholders are able to access the essential information about the study programmes (profile, learning outcomes, study plan, module descriptions), the experts expect FST to design separate homepages for all four study programmes, which include the before mentioned information. The homepages should be available in French and English.

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

The experts appreciate that FST will launch dedicated English-language webpages for each study programme, which will include essential information such as study plan, objectives, intended learning outcomes, and module descriptions. While the FST website has been updated and now provides information about Master's programmes in both French and English, the consultation of the site still shows some limitations. This indicates that the website still requires significant improvement to ensure the full availability of information for each Master's programme — from admission requirements to the complete curriculum and syllabi — and that such information should be provided in both French and English at a minimum, in order to guarantee transparency and accessibility for all stakeholders.

The experts acknowledge that FST will provide comprehensive module descriptions for all compulsory courses, including the final project and the internships in the ICPI programme. The decision to apply the official module description template from the Ministry across all programmes, while integrating ASIIN's recommendations, will significantly enhance consistency and transparency. It will be important to ensure that the revised module descriptions clearly present learning outcomes, workload distribution, assessment methods, and alignment with programme objectives, so that stakeholders can fully understand the competences students are expected to acquire.

With respect to wording the intended learning outcomes, it is certainly useful to offer training sessions for all instructors on Bloom's Taxonomy.

The revision of the study plan to allocate credits to the internships is a positive step. However, for accreditation purposes, it will be necessary to verify the effective implementation of this updated plan once it has been formally approved by the Faculty Scientific Council and the Ministry. Documented evidence of the approved version should be provided to confirm compliance with the recommendation in case of accreditation with requirements.

Together with its statement, FST has submitted sample Diploma Supplements for the ICAI and APCE programmes. The samples are aligned with the European template.

The experts consider criterion 4 to be mostly fulfilled.

5. Quality management: quality assessment and development

Evidence:

- Self-Assessment Reports
- Sample surveys for students and employers
- Discussions during the audit

Preliminary assessment and analysis of the experts:

The highest academic board at UTM is the University Council, which is responsible for implementing and supervising all academic processes at UTM. The President of UTM is the Chairman of the University Council. Vice-Presidents, Deans, Directors of Research Institutes, representatives of professors, lecturers, technical, and administrative staff, as well as students' representatives are its members.

The Dean is the Head of the Faculty of Sciences with the authority and responsibility for administering all teaching and learning activities within FST. The Dean of FST is primarily responsible for making strategic decisions relating to administrative and teaching services. The General Secretary of FST is responsible for running the administrative, financial, purchasing and technical services, as well as the staff working under the authority of the Dean (schooling, library, human resources, Informatics, photocopying, storage, fleet management, maintenance of premises and facilities, administrative support for the University administration). Finally, there are the Heads of the Departments, who are responsible for implementing all educational activities within the respective degree programmes.

The organisational structure of FST is depicted in the following diagram:

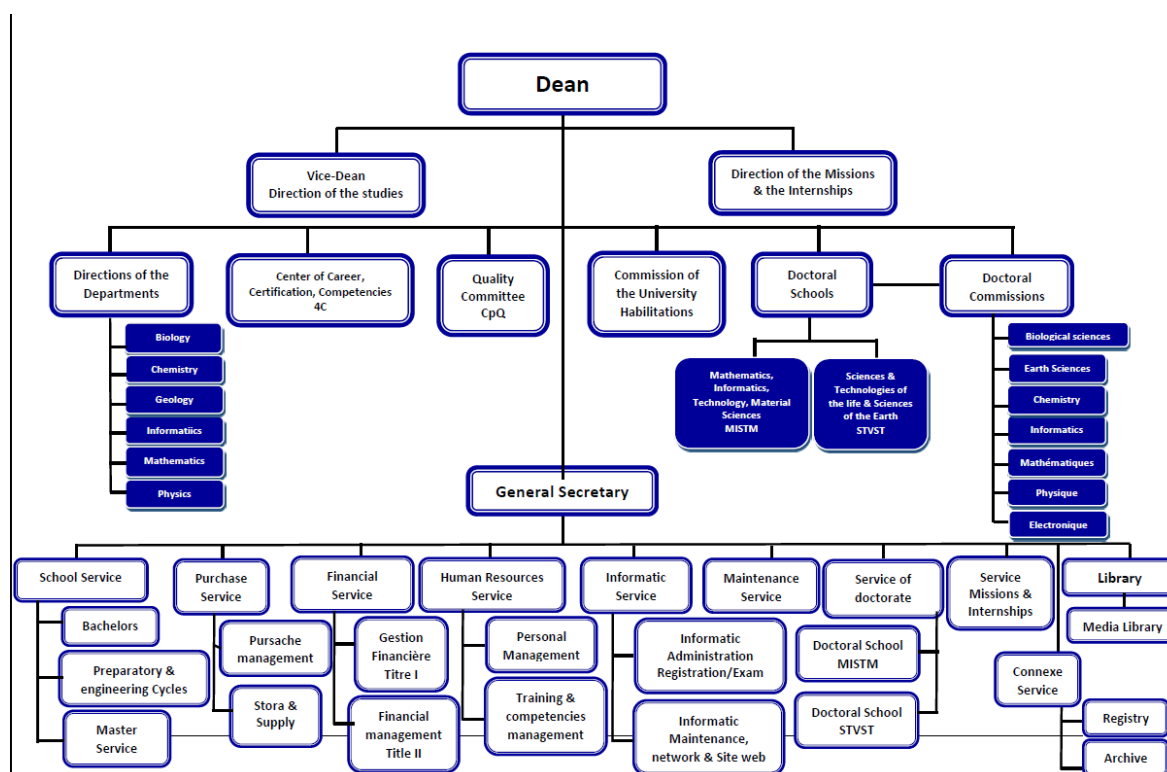


Diagram 1: Structure of FST, Source: SAR UTM

UTM students are elected as members of the University Council and the Scientific Council of FST in order to help creating adequate educational conditions and to protect the rights and interests of students. The main function of the University Council is to serve as the highest governing body of UTM. It is responsible for overseeing the overall academic, administrative, and financial activities of the university. The University Council typically makes key decisions on matters such as strategic development, academic affairs, budget and finance, regulatory compliance, and internal governance. The council ensures that the university's practices align with its strategic objectives and comply with national education regulations.

In addition, there is the Scientific Council at FST with the Dean, Vice-Deans, teachers, and students as members. Moreover, there is the Department Council, led by the elected Department Director (Head of Department), which meets at least once a month. Among its responsibilities is the continuous improvement of the programmes.

The FST has a Quality Committee (CpQ), it is made up of a wide range of members from FST and occasionally from the socio-economic world. The CpQ has several roles such as quality assurance training; development of tools for analysing quality assurance and performance indicators; management of satisfaction surveys of the various interested parties, and data collected for monitoring quality assurance and performance indicators for training courses and administrative staff; and evaluation of programmes and courses.

The Faculty of Sciences maintains contact with its alumni through professional social networks, follow-up surveys, and alumni events. Some of the alumni remain involved in the academic community by mentoring current students, participating in workshops, or collaborating on research projects. This active alumni network helps FST to monitor their career progression and to continuously improve the study programmes to meet labor market demands. In addition, there is the Career and Internship Office (Bureau des stages et de l'insertion professionnelle), which tracks graduates' professional career via surveys and direct follow-ups.

In order to evaluate the quality of the educational processes, FST conducts surveys with students, graduates, alumni, and employers. Satisfaction surveys to gather feedback from students are conducted at the end of each semester. Students assess various aspects such as organisation of learning, availability of teachers, exams, teaching resources, infrastructure and facilities, and student life.

Current students at the end of their study assess their satisfaction with the training, especially regarding the improvement of their competencies. Graduates who are employed within a year of completing the programme evaluate their satisfaction with the training concerning their job. Employers and industry professionals involved in the training and supervision give feedback with respect to their satisfaction with the interns and the training content, ensuring it provides the necessary competencies required by the job market.

The analysis of the surveys' results, along with other data collected on teaching methods and exams, has allowed FST to develop a detailed list of performance indicators (e.g. graduation time and rate, employment rate), which are used to identify and implement necessary corrective actions.

As the experts learn during the audit, it is not mandatory for students to participate in the satisfaction surveys. Every two years, FST submits a report on the students', alumni, and employers' feedback and possible changes in the programmes to UTM's management and subsequently to MESRS. These reports are also published on UTM's homepage.

The experts gain the impression that currently students' feedback is mainly gathered by direct discussions between students and teachers. This is fine and especially in study programmes with only a few students direct feedback is an important method for further developing the degree programmes. Nevertheless, the experts point out that the satisfaction questionnaires or the link to them should be sent to the students by e-mail before the end of each semester. It should be done at the same time for all courses and be conducted in the same way. It needs to be ensured that the students' feedback is anonymous and it should be done course by course. It would be useful to conduct the students' satisfaction survey several weeks before the end of the semester so that the teachers can inform the

students in the last or second last session about the results and possible measures for improvement. The standardised questionnaire should also include a question about students' workload, especially the time students need for self-studies. The feedback should be collected and analysed by the Quality Committee (CpQ) of FST. The results should then be sent to the respective teachers and the Dean so that there is follow-up process in case of negative feedback.

Informing students about the results of satisfaction surveys is necessary because sharing survey results shows students that their feedback is taken seriously and valued by UTM and FST. This transparency fosters a sense of trust and respect, making students feel heard and appreciated as stakeholders in their educational experience. In addition, when students see that their opinions lead to visible outcomes or changes, they are more likely to participate in future surveys. Consequently, the experts expect FST to inform students directly about the results of the questionnaires and about possible improvements in the respective course. Faculty members are encouraged to formally follow up on the implementation of the action plan for improvement to ensure sustained progress. The feedback loops need to be closed.

Moreover, the experts underline that there should be a regular and institutionalised survey on students' workload in every course. For example, this could be done by including a respective question in the satisfaction questionnaires that students have to fill out at the end of each semester. Regularly monitoring and evaluating student workload helps identify discrepancies between the estimated and actual workload experienced by students. This feedback loop allows institutions to adjust course design, teaching methods, and assessment strategies to better match the intended learning outcomes with the actual effort required. Such alignment is essential for quality assurance, ensuring that courses are neither overloaded nor under-demanding, and that students are not unfairly burdened or under-challenged (see Criterion 1.5).

The experts discuss with the representatives of UTM's partners from public institutions, and private companies if there are regular meetings with the partners on faculty or programme level, where they discuss the needs and requirements of the employers and possible changes to the degree programmes. They learn that UTM gets feedback from employers and via the assessment of students' performance in the end-of-year projects and employers discuss directly with teachers about possible improvements. The experts appreciate that UTM stays in contact with its alumni and the employers. However, no institutionalised advisory board exists. The experts acknowledge the important role of employer representatives who serve as teachers or instructors at FST. As the experts consider the input of external stakeholders such as alumni and employers (other than the external teaching experts) to be very important for the further development of the degree programmes, they

recommend establishing official advisory boards at the Faculty of Sciences in order to discuss regularly with them about the needs of the job market and new technical developments.

The advisory board should consist of a group of professionals, employers, and experts of the relevant fields from outside the university. Including students, professionals, and employers in the different boards will help further developing the degree programmes.

The experts gain the impression that the quality assurance system at UTM should be further developed in order to ensure high quality and continuous improvement of the study programmes. The experts appreciate that there is good and fruitful cooperation between the external stakeholders (employers, alumni) and the university and confirm that UTM regularly monitors and reviews the degree programmes to ensure that they achieve the objectives set for them. Additionally, the notice positively that students' are involved in the university's boards and appreciate the well established contacts to companies and institutions through the final projects, which results in good job opportunities.

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

The experts appreciate that FST is committed to providing formal feedback of the questionnaire results to students. Currently, this feedback is given informally and not consistently across all sections, usually through discussions with student groups and course coordinators. We are committed to establishing a structured procedure for course-by-course anonymous feedback. Results of satisfaction surveys will be systematically shared with students, accompanied by action plans for improvement. This procedure will be standardized across all programmes starting from the next academic year, ensuring consistent follow-up and transparency. The experts expect to receive verification of the implementation of the new processes in the further course of the accreditation procedure.

The Faculty's commitment to standardizing the procedure for anonymous course-by-course feedback and to systematically sharing survey results with students is a welcome improvement. To ensure effectiveness, it will be important that the new procedure is formally documented, consistently applied across all programmes, and supported by clear timelines for follow-up actions. It is necessary to verify the procedure's implementation, including evidence of anonymized survey instruments, documented feedback reports communicated to students, and examples of resulting improvement measures

The experts thank FST for explaining that FST already includes external stakeholders as members of its Scientific Council. The Dean invites them to meetings to discuss market

needs and adapt the curriculum. This board will provide guidance and feedback on curriculum development, internships, and research projects to ensure alignment with market and societal needs. The experts are satisfied with this involvement of external stakeholders.

The experts consider criterion 5 to be mostly fulfilled.

D Additional Documents

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

- none

E Comment of the Higher Education Institution (28.08.2025)

UTM provides the following statement:

"The Higher Education Institution, FST, fully endorses this report and kindly requests that the experts take into account the remarks and clarifications provided below. Evidence and supporting documents are also provided

Page 23; 2nd §, We would like to add:

"While the experts recommend offering advanced courses in data science and statistics to all Master's students, it should be noted that students in Biology already follow courses in Bioinformatics and Data Analysis. In these courses, they learn to access and work with databases related to health, genomics, proteomics, and transcriptomics. These learning activities are included in the study plans of the HSA and TCMB programmes, providing students with a solid foundation in data collection, cleaning, analysis, interpretation, and visualization."

Page 25; 2nd §: We would like to add:

"Additionally, the Department of Biology is involved in the PsyCoMed Marie Skłodowska-Curie Actions (MSCA) Staff Exchange (SE) HORIZON-2021-SE-01 under the grant agreement N°101086247project, TNE neurobrige which supports staff exchanges and student mobility. FST also participates in ERASMUS ICM/+ programmes in the fields of environment, health, and mathematics (ERASMUS/ICM+ FROUNE01)."(See attached documents for these approved projects.)

Page 35; 4th §: We would also like to clarify:

"The oral defense is conducted in accordance with the submission and defense deadlines set by the Faculty of Sciences of Tunis. Generally, the period between file approval and defense ranges from 3 weeks to 2 months, depending on the number of manuscripts to be reviewed. Decree 1227 (August 2021) requires a minimum of three weeks before the defense to allow candidates to provide the necessary copies to the jury."

Page 41; 1st §, We would like to add:

"A bioinformatics laboratory, which was not visited during the on-site visit by the ASIIN experts, is also available and used for both the HSA and TCMB programmes in the Department of Biology. Overall, the Department of Biology offers six teaching laboratories that support practical training and research activities for students enrolled in these programmes. In addition, the department has twelve other laboratories primarily dedicated to bachelor programme students, which can also provide access to a wide range of practical experiences in areas such as cellular biology, plant biology, animal physiology, genetics, biochemistry, and other core subjects relevant to the HSA and TCMB curricula."

Page 41, 2nd §, We would like to clarify:

"The Faculty of Sciences (FST) is fully aware of the issue regarding outdated equipment and has actively issued calls for tenders over the past years to acquire modern scientific equipment for the Department of Chemistry and other departments, aiming to enhance practical training quality. However, certain tenders could not be successfully completed due to procedural challenges under Tunisian regulations, such as price fluctuations caused by the devaluation of the Tunisian dinar. This led to the budget no longer covering the initially planned equipment and affected approval by the public expenditure controller. UTM is committed to increasing the budget allocated for equipment purchases to better account for such fluctuations. We are confident that in the coming years, these tenders will be successfully concluded, and the planned equipment will be acquired, thereby improving both teaching and research facilities."

Page 44, 2nd §, We would like to add:

"The FST website is now updated and includes relevant information for study programmes. The pages are available in both French and English, providing accessible and up-to-date information for students and other stakeholders." *Please check via this link <https://fst.rnu.tn/fr/masters> for i) Technologies Cellulaires et Moléculaires en Biosanté; ii) Hygiène et Sécurité Appliquée and iii) Environnement et Analyses Physico-Chimiques Industrielles programmes*

In the following areas, the experts see room for improvement:

We acknowledge the observations and recommendations of ASIIN experts. For each point raised, FST is committed to implementing the necessary measures to ensure continuous improvement. Detailed responses and actions for each recommendation are provided below

- There need to be module descriptions for all compulsory courses, this includes the final project and the internships in the ICAI programme. The module descriptions have to include all the required information. Additionally, it would be very useful if all the study programmes at FST would use the same template for the module descriptions.

Responses to comments of ASIIN:

We confirm that this recommendation will be fully implemented. Comprehensive module descriptions will be provided for all compulsory courses, including the final project and the internships in the ICPI programme. The Faculty of Sciences of Tunis already uses the module description template provided by the Directorate General for University Renovation of its supervising Ministry for all LMD programmes. This template will be applied to all study programmes, including the engineering cycle, while taking into account the recommendations of ASIIN, in order to ensure harmonization and consistency

- No credits are awarded for the first and the second internship in the ICAI programme. Additionally, these internships are not mentioned in the study plan nor are there any module descriptions for it.

Responses to comments of ASIIN

The Pedagogical Committee has made the necessary modifications following the remarks provided during the site visit. The study plan has been revised to allocate credits to the internships, and this updated study plan will be submitted to the Ministry of Higher Education and Scientific Research for approval

NB: An updated version of the study plan, incorporating your recommendations regarding the allocation of credits to the intermediate internships, will be provided once it has been approved by the Faculty Scientific Council and the competent authorities of our Ministry

- No sample Diploma Supplements, which are aligned with the European template, were submitted for the ICAI and ACPE programmes.

Responses to comments of ASIIN

In the previous submission of the SAR, a single Diploma Supplement model common to both ACPE and ICAI programmes was provided. Now, a programme-specific Diploma Supplement has been prepared for each programme (*Please see Diploma Supplement for the ICAI and ACPE programmes*).

- The instruments in the chemistry teaching laboratories, are quite old and should be replaced. Additionally, more advanced devices should be purchased so that students can get hands-on experience with current scientific methods. Students need to conduct the experiments by themselves, just a demonstration by the teachers is not sufficient. There should be a sufficient amount of consumables and reagents available.

Responses to comments of ASIIN

The Faculty of Sciences of Tunis has always prioritized the modernization of laboratories to provide students with hands-on experience using current scientific methods. However, as a public institution, such acquisitions are subject to public procurement procedures, and the administrative complexity of these processes often delays the timely acquisition of equipment and occasionally leads to unsuccessful purchases. Additionally, the University of Tunis El Manar has confirmed its financial and institutional support to the modernization of the FST scientific equipments for engineering cycle programmes. Our goal is to ensure that every student conducts experiments independently, with sufficient reagents and resources available, by the next academic cycle

- Safety standards must be strictly followed in all laboratories.

Responses to comments of ASIIN

Strict adherence to laboratory safety standards is a top priority. This will be ensured in all laboratories, particularly within the framework of the ISO 21001:2018 certification project, for which FST has committed to progress towards obtaining ISO 9001 certification for its Quality Management System (QMS).

- It is necessary to verify the students' total workload and to award the ECTS points accordingly. FST needs to make sure that between 25 and 30 hours are required for one ECTS point. Additionally, it needs to be made transparent, how many hours of students' workload are exactly required for one ECTS point.

Responses to comments of ASIIN

Study plans are being corrected to align credits with the actual workload, ensuring that 1 ECTS point represents between 25 and 30 hours of student work. A transparent methodology, including workload surveys and teaching activity logs, will be introduced to make this

alignment explicit. A formal request has been sent to the Ministry to authorize the revised plans.

- It needs to be ensured that the students' feedback is anonymous and it should be done course by course. The students need to be informed about the results of the satisfaction questionnaires. A follow-up procedure needs to be established.

Responses to comments of ASIIN

We thank the ASIIN team for this remark and commit to providing formal feedback of the questionnaire results to students. Currently, this feedback is given informally and not consistently across all sections, usually through discussions with student groups and course coordinators. We are committed to establishing a structured procedure for course-by-course anonymous feedback. Results of satisfaction surveys will be systematically shared with students, accompanied by action plans for improvement. This procedure will be standardized across all programmes starting from the next academic year, ensuring consistent follow-up and transparency.

- There need to be English homepages for each of the four study programmes, which include the essential information such as study plan, objectives and profile, intended learning outcomes, and module descriptions.

Responses to comments of ASIIN

Dedicated English-language webpages for each study programme will be launched, including essential information such as study plan, objectives, intended learning outcomes, and module descriptions. This will ensure better visibility for international partners and facilitate student mobility.

- Students' academic mobility is rather low and should be better promoted. The number of international cooperations and scholarships should be increased and students should be encouraged to spend some time abroad.

Responses to comments of ASIIN

The Faculty of Sciences of Tunis provides mobility scholarships within the framework of the ERASMUS programmes (*please see agreement for ERASMUS/ICM+ between UTM and University of Rouen Normandie (France) 2020 and 2025*), and the Ministry of Higher Education also offers annual scholarships for internships for engineering cycle students. In addition, our students can benefit from mobility opportunities through FST academic or research projects, such as TNE "TNE NEUROBRIDGE)", **proposal ID TNE23-0034** <https://www.sns.it/en/transnational-educational-initiatives-tne>", cross-border projects, and Horizon Europe (please see agreement for Horizon project and TNE Project), although eligibility is generally for

students pursuing doctoral studies. To improve this, we are actively informing students through dedicated mentoring about these opportunities and our target is to double participation within the next two academic years.

- It is highly useful for all teachers to know about Bloom's Taxonomy and how to correctly formulate learning outcomes.

Responses to comments of ASIIN

Training sessions on learning outcome formulation based on Bloom's Taxonomy will be systematically provided for all instructors. While, many staff members are already familiar with Bloom's Taxonomy and its application in formulating learning outcomes.

- It would be useful to issue an official AI guideline for all students at UTM and to teach all students on correctly using AI.

Responses to comments of ASIIN

UTM, in collaboration with its institutions notably FST, is preparing an official AI usage charter and guidelines for teaching and learning. These will include training modules for students and staff, ensuring that AI tools are used responsibly, ethically, and effectively.

- Offer more excursions/site-visits to companies so that students get a better impression where to do the internships and the final project and what the focus of the different companies is.

Responses to comments of ASIIN

Additional efforts will be made to strengthen visits to industrial sites, allowing students to better immerse themselves in the professional world and learn about company requirements after graduation.

- The oral defense should be conducted directly after finishing the end-of-study project, some graduates had to wait up to six months before the oral defense was conducted.

Responses to comments of ASIIN

Oral defenses are formally scheduled and deadlines are communicated via the FST website and programme coordinators. Measures have been taken to minimize delays, and exceptional cases will be closely monitored to ensure defenses are conducted directly after project completion. We ensure that any delays are anticipated in advance; such cases are very rare.

- It would be very useful to offer electives in all four programmes. For example, this can be achieved by opening courses from other majors.

Responses to comments of ASIIN

Starting from the 2025–2026 academic year, at least three elective modules will be offered to students, who can choose two among them in all programmes. These modules will be submitted for approval by the FST Scientific Council at the beginning of September. Once approved, they will be implemented in the study plan and published for students.

- It would be very useful to facilitate the communication between the hosting institutions and FST for organising the final projects.

Responses to comments of ASIIN

The programme coordinators ensure smooth and active communication with the hosting institutions. The FST administration has implemented a communication system via meetings organized by the hosting institutions and validated by the FST Pedagogical Committees. This system will be applied starting from the 2025–2026 academic year. Minutes of these meetings (in French) are available.

- Establish a comprehensive digital platform for students and teachers.

Responses to comments of ASIIN

Our university is currently implementing a new pedagogical platform for all its institutions, including FST, as part of the new information system project. We expect that this system will significantly enhance digital teaching and learning.

- It would be useful to adjust the English translation of the name of the ICIA programme and the HSA programme.

Responses to comments of ASIIN

▪ **For ICIA programme:** Following the recommendations of the ASIIN experts formulated during the on-site visit and mentioned on page 15 of the present report, the Faculty of Sciences of Tunis is committed to revise the study plan in order to introduce modules that are more suitable and more appropriate to engineering studies, in line with ASIIN's recommendations. In this context, the pedagogical team of the ICAI engineering cycle has already initiated meetings to carry out a complete revision of the study plan. The revised programme will integrate additional engineering-oriented subjects such as process control and automation, process engineering and design, data analysis and statistics, bioprocess engineering, reaction technology, safety technology, and systems engineering, in order to better reflect the engineering profile of the programme.

This revised programme will be submitted to the General Directorate of Technological Studies of our Ministry for approval. We expect to receive a favorable response during the academic year 2025–2026, so that the new study plan can be implemented starting from the next academic year.

FST wishes to maintain the term “**Engendering**” in the degree title of ICAI programme. The FST commits to providing ASIIN with the updated study plan once it has been officially approved by the Ministry

▪ **For HSA programme:** as suggested by ASIIN expert to make the focus on management transparent in the English translation of the programme’s name, the following name will be submitted to the Ministry of Higher Education and Scientific Research for approval : **Management of Quality, Hygiene, Safety and Environment**

- There is no advisory board with external stakeholders at FST

Responses to comments of ASIIN

FST already includes external stakeholders as members of its Scientific Council. The Dean invites them to meetings to discuss market needs and adapt the curriculum, particularly during periods of programme re-habilitation or new habilitation. This mechanism ensures that stakeholder input is considered in curriculum development and programme evaluation. This board will provide guidance and feedback on curriculum development, internships, and research projects to ensure alignment with market and societal needs.

F Summary: Expert recommendations (05.09.2025)

Taking into account the additional information and the comments given by UTM, 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
Ma Analytical Chemistry and Instrumentation	With requirements for one year	Euromaster®	30.09.2031
Ma Physico-Chemical Analysis and Environment	With requirements for one year	Euromaster®	30.09.2031
Ma Cellular and Molecular Technologies in BioHealth	With requirements for one year	-	30.09.2031
Ma Hygiene and Safety Applied to Health and the Environment	With requirements for one year	-	30.09.2031

Requirements

For all degree programmes

- A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly. Make sure that between 25 and 30 hours are required for one ECTS point and make transparent, how many hours of students' workload are exactly required for one ECTS point.
- A 2. (ASIIN3.2) Strictly follow international standards on safety regulations in all laboratories.
- A 3. (ASIIN 4.1) Submit updated and complete module descriptions for all compulsory courses.
- A 4. (ASIIN 4.1) Provide English homepages for each of the four study programmes, which include the essential information about the programme such as study plan, objectives and profile, intended learning outcomes, and module descriptions.
- A 5. (ASIIN 5) Make sure that the students' feedback is collected anonymously and is done course by course. The students need to be informed about the results of the satisfaction questionnaires and a follow-up procedure needs to be established.

For the ICAI and APCE programmes

- A 6. (ASIIN 3.2) Submit a concept and a timetable on how to update the instruments and how to renovate the laboratories within the accreditation period.
- A 7. (ASIIN 3.2) Ensure that students conduct the experiments by themselves and that they get hands-on experience with current scientific methods.
- A 8. (ASIIN 3.2) Make sure that a sufficient amount of consumables and reagents is available in the laboratories.

For the ICAI programme

- A 9. (ASIIN 1.3) Award credits for all compulsory courses.
- A 10. (ASIIN 1.3) The study plan needs to include the compulsory internships after the first and second year of studies.

Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to issue an official AI guideline for all UTM students and to teach all students on correctly using AI.
- E 2. (ASIIN 1.3) It is recommended to further promote and students' academic mobility and to establish more international cooperations and to provide more scholarships.
- E 3. (ASIIN 1.3) It is recommended to offer more excursions/site-visits to companies so that students get a better impression where to do the internships and the final project and what the focus of the different companies is.
- E 4. (ASIIN 1.3) It is recommended to offer electives in all four programmes. For example, this can be achieved by opening courses from other majors.
- E 5. (ASIIN 1.3) It is recommended to facilitate the communication between the hosting institutions and FST for organising the final projects.
- E 6. (ASIIN 2) It is recommended to conduct the oral defense directly after finishing the end-of-study project.
- E 7. (ASIIN 3.1) It is recommended to establish a comprehensive digital platform for students and teachers.
- E 8. (ASIIN 4.1) It is recommended to use the same template for the module descriptions for all study programmes at FST.

- E 9. (ASIIN 4.1) It is recommended to teach all teachers how to use Bloom's Taxonomy and how to correctly formulate learning outcomes and module descriptions.

For the ICAI programme

- E 10. (ASIIN 1.2) It recommended to better align the English translation of the title of the study programme with its content.

For the HSA programme

- E 11. (ASIIN 1.2) It recommended to adjust the English translation of the name of the study programme in order to make the programme's focus on management transparent.

G Comment of the Technical Committees (18.09.2025)

Technical Committee 09 – Chemistry, Pharmacy (17.09.2025)

The TC confirms that there is a great need for improvement in infrastructure and technical equipment, especially in chemistry, including the rectification of deficiencies in safety standards in laboratories. There is further room for improvement in the module descriptions, the website, the information provided to students about the results of teaching evaluations, the calculation of student workload, and the awarding of ECTS credits for all compulsory courses. A total of 10 requirements are to be imposed on these points. In addition, the experts propose 11 recommendations. After a brief discussion, the TC approves the proposed requirements and recommendations.

Assessment and analysis for the award of the Euromaster® label:

The TC confirms that the Euromaster® label can be awarded after the requirements are fulfilled

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

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
Ma Analytical Chemistry and Instrumentation	With requirements for one year	Euromaster® upon fulfilment of the requirements	30.09.2031
Ma Physico-Chemical Analysis and Environment	With requirements for one year	Euromaster® upon fulfilment of the requirements	30.09.2031

Technical Committee 10 – Life Sciences (18.09.2025)

The TC confirms that there is a great need for improvement in infrastructure and technical equipment, especially in chemistry, including the rectification of deficiencies in safety

standards in laboratories. There is further room for improvement in the module descriptions, the website, the information provided to students about the results of teaching evaluations, the calculation of student workload, and the awarding of ECTS credits for all compulsory courses. A total of 10 requirements are to be imposed on these points. In addition, the expert group proposes 11 recommendations. After a brief discussion, the TC approves 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 labels	Maximum duration of accreditation
Ma Cellular and Molecular Technologies in BioHealth	With requirements for one year	-	30.09.2031
Ma Hygiene and Safety Applied to Health and the Environment	With requirements for one year	-	30.09.2031

H Decision of the Accreditation Commission (26.09.2025)

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

The Accreditation Commission discusses the procedure and confirms the proposed requirements and recommendations.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ma Analytical Chemistry and Instrumentation	With requirements for one year	Euromaster® upon fulfilment of the requirements	30.09.2031
Ma Physico-Chemical Analysis and Environment	With requirements for one year	Euromaster® upon fulfilment of the requirements	30.09.2031
Ma Cellular and Molecular Technologies in BioHealth	With requirements for one year	-	30.09.2031
Ma Hygiene and Safety Applied to Health and the Environment	With requirements for one year	-	30.09.2031

Requirements

For all degree programmes

- A 1. (ASIIN 1.5) Verify the students' total workload and award the ECTS points accordingly. Make sure that between 25 and 30 hours are required for one ECTS point and make transparent, how many hours of students' workload are exactly required for one ECTS point.
- A 2. (ASIIN3.2) Strictly follow international standards on safety regulations in all laboratories.
- A 3. (ASIIN 4.1) Submit updated and complete module descriptions for all compulsory courses.

- A 4. (ASIIN 4.1) Provide English homepages for each of the four study programmes, which include the essential information about the programme such as study plan, objectives and profile, intended learning outcomes, and module descriptions.
- A 5. (ASIIN 5) Make sure that the students' feedback is collected anonymously and is done course by course. The students need to be informed about the results of the satisfaction questionnaires and a follow-up procedure needs to be established.

For the ICAI and APCE programmes

- A 6. (ASIIN 3.2) Submit a concept and a timetable on how to update the instruments and how to renovate the laboratories within the accreditation period.
- A 7. (ASIIN 3.2) Ensure that students conduct the experiments by themselves and that they get hands-on experience with current scientific methods.
- A 8. (ASIIN 3.2) Make sure that a sufficient amount of consumables and reagents is available in the laboratories.

For the ICAI programme

- A 9. (ASIIN 1.3) Award credits for all compulsory courses.
- A 10. (ASIIN 1.3) The study plan needs to include the compulsory internships after the first and second year of studies.

Recommendations

For all degree programmes

- E 1. (ASIIN 1.3) It is recommended to issue an official AI guideline for all UTM students and to teach all students on correctly using AI.
- E 2. (ASIIN 1.3) It is recommended to further promote and students' academic mobility and to establish more international cooperations and to provide more scholarships.
- E 3. (ASIIN 1.3) It is recommended to offer more excursions/site-visits to companies so that students get a better impression where to do the internships and the final project and what the focus of the different companies is.
- E 4. (ASIIN 1.3) It is recommended to offer electives in all four programmes. For example, this can be achieved by opening courses from other majors.
- E 5. (ASIIN 1.3) It is recommended to facilitate the communication between the hosting institutions and FST for organising the final projects.

- E 6. (ASIIN 2) It is recommended to conduct the oral defense directly after finishing the end-of-study project.
- E 7. (ASIIN 3.1) It is recommended to establish a comprehensive digital platform for students and teachers.
- E 8. (ASIIN 4.1) It is recommended to use the same template for the module descriptions for all study programmes at FST.
- E 9. (ASIIN 4.1) It is recommended to teach all teachers how to use Bloom's Taxonomy and how to correctly formulate learning outcomes and module descriptions.

For the ICAI programme

- E 10. (ASIIN 1.2) It recommended to better align the English translation of the title of the study programme with its content.

For the HSA programme

- E 11. (ASIIN 1.2) It recommended to adjust the English translation of the name of the study programme in order to make the programme's focus on management transparent.

Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **objectives** and **specific learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Cellular and Molecular Technologies in BioHealth:

a. The acquisition of advanced scientific, technical, and technological knowledge

The program aims to impart the following knowledge areas:

- In-depth understanding of molecular and cellular biology and their applications.
- Mastery of cellular and molecular biotechnologies.
- Insight into cellular physiological regulations and dysfunctions associated with pathologies such as autoimmune diseases, tumors and cancers, and metabolic disorders.
- Proficiency with tools for cell biology, genetic, microbiological, and immunological analysis, as well as physico-chemical methods for analyzing biomolecules.
- Expertise in experimental approaches, analytical methods, and the validation of results in cell and molecular research.

b. The acquisition of managerial and organizational skills

This expertise focuses on achieving **efficiency and versatility**, which can be developed through internships and workshops that place students in unfamiliar environments. These experiences help students evaluate their skills in mobilization and adaptation in the following areas:

- Developing and refining analysis methods and biological control tests, while optimizing and validating analytical techniques.
- Formulating research hypotheses and methods, as well as collecting and analyzing data.
- Conducting measurements and analyzing results.
- Creating protocols, activity reports, and diagnostic reports, writing publications and staying current with scientific, technological, technical, and regulatory information.
- Mastering computer tools and statistical data essential for exploiting results.
- Developing Professional projects.

c. The acquisition of behavioral, communication, and cultural skills

It focuses on developing **autonomy, ethical responsibility, and key relational and communication skills**, including:

- Collaborative work and the ability to lead projects.
- Effective oral and written communication about activities undertaken.
- Respect for partners, work, and deadlines.
- Organizational skills and ethical responsibility.
- Independence in managing and executing projects, while also integrating effectively within an organization in line with their assigned mission.
- Managerial skills in project management, including budgeting, financial tracking, human resources management, meeting facilitation, team leadership, and proficiency in foreign languages.
- Understanding of quality and safety standards, as well as national and international biotechnology regulations.

F1 C Family 1 Scientific and technical tools	SLo1	Master advanced fundamental scientific knowledge and its scientific tools
	SLo2	Develop and manage innovative technological tools in biology and biotechnology
F2 C Family 2 Technological competencies	SLo3	Master and implement analytical and validation procedures for product quality control
	SLo4	Design, optimize, and validate bioassays in compliance with bioethics rules
	SLo5	Manage and process biological data
	SLo6	Implement advanced and innovative techniques for screening biomolecules
	SLo7	Implement Quality Management Systems for Bioindustry Laboratories
	SLo8	Design and plan experimental strategies for complex systems
F3 C Family 3 Communication and management competencies	SLo9	Master foreign languages and communication skills
	SLo10	Master managerial culture and industrial openness
F4 C Family 4 Self-development, innovation, and projects competencies	SLo11	Master personal research and self-development, entrepreneurial initiatives, and soft skills

0 Appendix: Programme Learning Outcomes and Curricula

The following **curriculum** is presented:

Semester 1

Unit TU		Unit element constitutive CETU		Credits	Coeff.	Workload	Assimilation	Workload division				Evaluation	
Code TU	Intitule TU	Code ECUE	Intitule CETU				Self-Study	Course	DW	PW	PPW	CC	RM
11	Biology and Cellular Technologies	111	Cell, Bio-membrane and signaling	3	1,5	42h	40h	21h	7h	14h			X
		112	Cell-based study techniques	3	1,5	42h	40h	21h	7h	7h	7h		X
12	Microbiology and Molecular Immunology	121	Internship: Microbiological diagnostics and bio-health applications	3	1,5	42h	40h	21h	7h	7h	7h		X
		122	Molecular Immunology	3	1,5	42h	40h	21h	7h		14h		X
13	Genetics and genomics technologies	131	Genome research methodologies	3	1,5	42h	40h	21h	7h	7h	7h		X
		132	Recombinant DNA technologies	3	1,5	42h	40h	21h	7h	7h	7h		X
14	Entrepreneurial Skills & Bioinformatics	141	Bioinformatics	3	1,5	35h	50h	14h	7h		14h	X	
		142	Business development & entrepreneurial soft skills	3	1,5	35h	50h	14h	7h		14h	X	
15	Cellular biotechnology and quality control	151	Internship: Cell Culture: Methodologies and Laboratory Quality Management System	3	1,5	42h	40h	14h		14h	14h	X	
		152	Bioanalytical approaches	3	1,5	42h	40h	21h	7h	14h		X	
			Global / Semester 1	30	15	406H	420H	189H	63H	70H	84H	3	7
			Percentages/type of Workload			100%		46,6%	15,6%	17,2%	20,6%	30%	70%

Semester 2

Unit TU		Unit element constitutive CETU		Credits	Coef.	Workload	Assimilation	Workload division				Evaluation	
Code TU	Intitule TU	Code CETU	Intitule CETU				Self-Study	Course	DW	PW	PPW	CC	RM
21	Diseases and diagnostic tools	211	Molecular Methods in Human Pathology	3	1,5	42	40	21	7	14			X
		212	Cellular and molecular aspects of pathologies	3	1,5	42	40	21	7	14			X
22	Innovative Molecular Technologies & Biotherapies	221	RNA technology and transcriptomics	3	1,5	42	40	21	7	14			X
		222	Immuno-technology and Biotherapy	3	1,5	42	40	21	7	14			X
23	Proteomics & Applied Bioanalytical Techniques	231	Proteomics methodologies	3	1,5	42	40	21	7	14			X
		232	Applied bioanalytical techniques in metabolomics and toxicology	3	1,5	42	40	21	7	7	7		X
24	Internship Entrepreneurial and Bio-informatics II & Communication skills	241	English Certification and Technical Communication	2	1	28	30	14	7		7	X	
		242	Management of Innovative Projects	2	1	28	30	14		7	7	X	
		243	Structural Bioinformatics	2	1	28	30	14	7		7	X	
25	Cellular biotechnology and quality control	251	Internship: Autoimmune disease diagnosis	3	1,5	35	50	14		7	14		X
		252	Cytomics, Pathologies, and Cytological Techniques	3	1,5	35	50	21		7	7		X
			Global / Semester 2	30	15	406H	430H	202H	56H	98H	49H	3	8
			Percentages/type of Workload			100%		50%	13,8%	24,1%	12,1%	27%	73%

Semester 3

Unit TU		Unit element constitutive CETU		Credits	Coef.	Workload	Assimilation	Workload division				Evaluation	
Code TU	Intitule TU	Code CETU	Intitule CETU				Self-Study	Course	DW	PW	PPW	CC	RM
31	Cell metrology and imaging systems	311	Metrology for imaging systems	3	1,5	42	40	21		14	7		X
		312	Flow cytometry and diagnostics tools	3	1,5	42	40	14	14	14		X	
32	Biomolecule screening & pharmacology	321	Biomolecule Screening Techniques	3	1,5	42	40	21	7	7	7		X
		322	Internship: Methods applied to Pharmacology	3	1,5	42	40	21	7		14		X
33	Analytical methods, validation, and quality approach	331	Management of quality in the health sector	3	1,5	42	40	14	14	14		X	
		332	Pharmaceutical production processes and quality control procedures	3	1,5	35	50	21		14			X
34	Entrepreneurial ecosystem and innovation	341	Success preparation and communication	2	1	28	30	14	7	7		X	
		342	The entrepreneurial ecosystem	2	1	28	30	14	7	7		X	
		343	Innovation, Technology Transfer, and Intellectual Property	2	1	28	30	14	7	7		X	
35	Emerging professional skills	351	Legislation, Biosafety, Biosecurity and Bioethics	2	1	28	30	14	7	7			X
		352	Internship: Monoclonal Antibodies production process	2	1	28	30		7	7	14	X	
		353	Techniques and Methodologies in Microbiology	2	1	28	30	14		7	7	X	
			Global / Semester 3	30	15	406H	430H	182H	77H	105H	49H	7	5
			Percentages/type of Workload			100%		44%	18%	25,9%	12,1%	60%	40%

Semester 4

Unit TU		Unit element constitutive CETU		Credits	Workload	Assimilation	Workload division				Evaluation	
Code TU		Intitule CETU					Course	DW	PW	PPW	CC	
	ESP: End of Study Project Dans un organisme professionnel du domaine	Global / Semester 4		30	450H	430H				450H	X	
Percentages/type of Workload					100%					100%	100%	

According to the Self-Assessment Report, the following **specific learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Hygiene and Safety Applied to Health and the Environment:

	HSA	
C Family 1 : Scientific and technical tools	SLO1	Master and mobility of scientific tools and advanced basic sciences
	SLO2	Master of advanced scientific tools in health and the environment hygiene and safety
C Family 2: Technological Competencies	SLO3	Design innovative hygiene solutions applied to health and the environment
	SLO4	Management and piloting hygiene solutions in hostile environments
	SLO5	Implementing standardization solutions applied to health and the environment
	SLO6	Design and implement health and environmental projects
	SLO7	Analysis, optimizing and validating the quality of agri-food products
	SLO8	Master and conduct of experimental trials in biology
C Family 3 Communication and management	SLO9	Master of foreign languages and communication techniques
	SLO10	Management culture and industrial culture and openness
C Family 4: Self-development, innovation and projects	SLO11	Personal self-development (research and development) Entrepreneurial projects and soft skills

The following **curriculum** is presented:

Semester 1

UNIT	Courses	Credit	Workload	Assimilation : self study	Workload division				Assessment mode		
					Course	D.W.	P.W.	P.P.W.	CA	MS	VV
UE1: Transversal Unit	English	2	28	28	14	7	0	7	x		
	Statistical Methods	3	35	45	21	7	0	7	x		
UE2: Analytical and applied chemistry	Analytic applied chemistry	3	42	42	21	14	7	0		x	
	Applied chemistry	3	42	42	21	14	7	0		x	
UE3: Quality control and biochemical analysis techniques	Biochemical analysis techniques	3	42	42	21	14	7	0		x	
	Quality control	4	49	50	21	14	0	14		x	
UE4: Techniques applied to biology and health	Nucleic acid analysis techniques	3	42	42	21	14	7	0		x	
	Immunological techniques	3	42	42	21	14	7	0		x	
UE 5: Zoonoses and mycoses	Mycosis and Mycological risk	3	42	42	21	14	7	0		x	
	Zoonoses and zoonotic risks	3	42	42	21	14	7	0		x	
Global / Semester 1		30	406	417	203	126	49	28			
Percentages / type of Workload			100 %		50 %	31 %	12,06 %	6,8 %			

L : Lecture ; Tt : Tutorial ; PrW : Practical Work ; CA : Continuous Assessment ; MS : Mixed System ; VV : Viva Voice

Semester 2

UNIT	Courses	Credit	Workload	Assimilation: : self study	Workload division				Assessment mode		
					Course	D.W.	P.W.	P.P.W.	CA	MS	VV
Transversal Unit	Entrepreneurship	3	35	45	14	7	0	14	x		
	communication techniques	3	35	45	14	7	0	14	x		
	Water hygiene	3	42	42	21	14	7	0		x	
UE1: Food hygiene and safety water hygiene	Food hygiene and safety	3	42	42	21	7	0	14		x	
UE2: Bio-production management and environment	Animal bioproduction and environment	3	42	42	21	14	0	7		x	
	Plant bioproduction management and environment	3	42	42	21	14	0	7		x	
UE3: Risk management in the fields of health and the environment	Environmental risk management	3	42	42	21	14	7	0		x	
	Risk management in the health sector	3	42	42	21	7	0	14		x	
UE4: Waste management	Solid waste treatment	3	42	42	21	7	0	14		x	
	Hospital waste management	3	42	42	21	7	0	14		x	
Global / Semester 2		30	406	426	196	98	14	98			
Percentages / type of Workload			100 %		48,2 %	24,1 %	3,4 %	24,1 %			

Semester 3

UNIT	Courses	Credit	Workload	Assimilation: self study	Workload division				Assessment mode		
					Course	D. W.	P. W.	P.P. W.	CA	MS	V V
UE1: transversal Unit	Project management	2	28	28	14	7	7	0	x		
	Computer science and bioinformatics	2	28	28	14	7	7	0	x		
UE2: Quality standards and regulatory aspects	Quality standards	3	42	42	21	7	0	14		x	
	Regulatory aspects of health and environment	3	35	45	21	7	0	7		x	
UE3: Biosafety, vaccinology and epidemic-surveillance	Epidemiological-surveillance	2	28	28	21	7	0	0		x	
	Biosafety and vaccinology	3	35	45	21	14	0	0		x	
UE4: Applied microbiology ecotoxicology	Ecotoxicology	3	42	42	21	14	7	0		x	
	Applied microbiology for food industry	3	42	42	21	14	7	0		x	
	integrated Management systems	3	42	42	21	7	0	14		x	
UE5: Standardisation and SMI-QSE	Standardization Environment	2	28	45	21	7	0	0		x	
Optionnelles	Bioproduct preservation techniques	2	28	28	21	7	0	0		x	
	Bioproduct transformation techniques	2	28	28	14	7	0	7		x	
Global / Semester 3		30	406	443	231	105	28	42			
Percentages / type of Workload			100 %		56,8	25,8	6,8	10,3			

Semester 4

Unit	Courses	Credits	Workload	Assimilation: self study	Workload division			
					Course	DW	PW	PPW
Global / Semester 4		30	450H	430H				450H
Percentages / type of Workload			100%					100 Supprim er les mots PV%

According to the Self-Assessment Report, the following **specific learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Analytical Chemistry and Instrumentation:

✧ **Foundational Knowledge and Critical Thinking**

- **Comprehensive Understanding of Analytical Chemistry:** Acquire a thorough understanding of the principles and theories underlying analytical chemistry.
- **Critical Evaluation of Scientific Methods:** Develop the ability to critically evaluate various analytical methods and instrumentation techniques.
- **Advanced Theoretical Knowledge:** Gain advanced knowledge in areas such as spectroscopy, chromatography, and electrochemical analysis.
- **Interdisciplinary Integration:** Integrate concepts from chemistry, physics, and engineering to address complex analytical challenges.

✧ **Strong Problem-Solving and Analytical Skills**

- **Mastery of Analytical Techniques:** Achieve proficiency in the use of sophisticated analytical techniques and instrumentation.
- **Data Interpretation and Statistical Analysis:** Develop skills in interpreting complex analytical data and performing rigorous statistical analyses.
- **Innovative Problem-Solving:** Cultivate the ability to design and implement innovative solutions to analytical problems in various industrial and research contexts.
- **Laboratory and Field Work Proficiency:** Gain expertise in conducting precise and accurate experiments both in the laboratory and in field settings.

✧ **Applied Skills and Professional Practice**

- **Practical Application of Theories:** Apply theoretical knowledge to practical scenarios through hands-on projects and real-world case studies.
- **Instrumentation Operation and Maintenance:** Develop skills in the operation, calibration, and maintenance of advanced analytical instruments.
- **Quality Control and Assurance:** Understand and implement quality control and assurance practices in analytical laboratories.
- **Regulatory and Compliance Knowledge:** Acquire knowledge of relevant regulations and standards to ensure compliance in analytical practices.

✧ **Communication, Collaboration, and Professional Development**

- **Effective Communication:** Enhance skills in writing technical reports, scientific papers, and delivering oral presentations to convey complex analytical information clearly.
- **Team Collaboration:** Develop strong collaboration skills through team-based projects and interdisciplinary research efforts.
- **Professional Networking:** Build a professional network by interacting with industry experts, academic peers, and participating in professional organizations.
- **Continuous Learning and Development:** Foster a commitment to lifelong learning and professional development to stay current with technological advancements in analytical chemistry and instrumentation.

	ICAI	
F1 (C Family 1) Scientific and technical tools	SLo1	Master scientific tools and advanced fundamental subjects
	SLo2	Master and mobilize innovative technological tools in chemistry
F2 (C Family 2) Technological Competencies	SLo3	Design, plan and develop physico-chemical analysis solutions according to normative and regulatory standards
	SLo4	Ensure the design , development and physicochemical characterization of innovative materials
	SLo5	Test and validate analysis protocols for complex and risky solutions
	SLo6	Design, develop and optimize industrial processes for sustainable development
	SLo7	Calibrate, calibrate devices and present experimental results of physicochemical analysis in a normative manner
	SLo8	Design and implement methodologies for characterizing and treating residues of different origins
F3 (C Family 3) Communication and management competencies	SLo9	Master foreign languages and communications techniques
	SLo10	Master managerial aspects, culture and industrial openness and soft skills
F4 (C Family 4) Self-development, innovation and projects competencies	Slo11	Personal self-development (R& D) and project management

0 Appendix: Programme Learning Outcomes and Curricula

The following **curriculum** is presented:

Semester 1

Year	Semester	UNIT	Courses	Credit	Workload	Assimilation	Workload division				Evaluation	
							Course	DW	PW	PPW	CC	RM
1	1		Energetic	3	42	42	21	14		7		X
			Thermodynamic and kinetic lab	2	28	28			14	14		X
			Organic chemistry	3	42	42	21	14		7		X
			Chemistry of solutions	3	42	42	21	14		7		X
			Applied electrochemistry	3	42	42	21	14		7		X
			Qualitative analysis Inorganic	3	42	42	21	14		7		X
			Metallurgy	3	42	42	21	14		7		X
			Inorganic analysis lab	3	42	42			21	21		X
			Applied computer sciences	1	21	21	14	5		2		X
			Computer sciences lab	3	42	42			21	21		X
			English	3	42	42	21	14		7		X
	Sommatation S1			30	427	427	161	103	56	107		

Semester 2

Year	Semester	UNIT	Courses	Credit	Workload	Assimilation	Workload division				Evaluation	
							Course	DW	PW	PPW	CC	RM
1	2		Thermodynamic in solutions	3	42	42	21	14		7		X
			Kinetic and catalysis	3	42	42	21	14		7		X
			Titrimetry	3	42	42	21	14		7		X
			Titrimetry and electrochemistry lab	3	42	42			21	21		X
			Functional organic analysis	1	21	21	14	5		2		X
			Organic chemistry lab	2	28	28			14	14		X
			Molecular spectroscopy	3	42	42	21	14		7		X
			Molecular spectroscopy lab	2	28	28			14	14		X
			Spectrometry of atomic absorption	3	42	42	21	14		7		X
			Spectrometry of atomic absorption lab	2	28	28			14	14		X
			Statistics calculus	3	42	42	21	14		7		X
			French expression techniques	1	21	21	14	5		2		X
			General economy	1	21	21	14	5		2		X
	Sommaton S2			30	441	441	168	99	63	111		

Semester 3

Year	Seme ster	UNIT	Courses	Credit	Workload	Assimila tion	Workload division			
							Course	DW	PW	PPW
2	1		Electronics	3	42	42	21	14		7
			Organic materials	3	42	42	21	14		7
			NMR analysis	3	42	42	21	14		7
			Numeric analysis	3	42	42	21	14		7
			Pharmaceutical chemistry	1	21	21	14	5		2
			MS spectrometry	3	42	42	21	14		7
			Methods of seperation	3	42	42	21	14		7
			Biochemisty	3	42	42	21	14		7
			Applied computer sciences	1	21	21	14	5		2
			English	3	42	42	21	14		7
			Material sciences lab	2	28	28			14	14
			computer science lab	2	28	28			14	14
		Sommtion S3		30	434	434	196	122	28	88

Semester 4

Year	Semester	UNIT	Courses	Credit	Workload	Assimilation	Workload division				EVALUATION	
							Course	DW	PW	PPW	CC	RM
2	2		Organic materials analysis	3	42	42	21	14		7		X
			Inorganic materials	3	42	42	21	14		7		X
			X ray analysis	2	28	28	14	5		9		X
			Thermogravimetry	1	21	21	14	5		2		X
			Chromatographic technics	2	28	28	14	7		7		X
			Instrumentation I	1	21	21	14	5		2		X
			Instrumentation II	1	21	21	14	5		2		X
			Metrology	3	42	42	21	14		7		X
			Techniques of communication	3	42	42	21	14		7		X
			Corporate culture	1	21	21	14	5		2		X
			Electronics lab	2	28	28			14	14		X
			Methods of seperation lab	2	28	28			14	14		X
			Instrumentation and metrology lab	2	28	28			14	14		X
			Pharmaceutical chemistry lab	2	28	28			14	14		X
			Materials lab	2	28	28			14	14		X
		Sommtion S4		30	448	448	168	88	70	122		

Semester 5

Year	Semester	UNIT	Courses	Credit	Workloa	Assimilation	Workload division			PPW	Evaluation	
							Course	DW	PW		CC	RM
3	1		Validation of analytical methods	3	42	42	21	14		7		X
			Analysis and water treatment	3	42	42	21	14		7		X
			Standard and quality control	3	42	21	14	7		21		X
			Agri-food biotechnology	3	42	21	14	7		21		X
			Electrochemical methods of analysis	3	42	42	21	14		7		X
			Industrial processes	3	42	21	14	7		21		X
			Chemical engeneering	3	42	21	14	7		21		X
			Chemistry of essential oils	3	42	21	14	7		21		X
			Health and Safety	3	42	21	14	7		21		X
			English	1	21	21	14	5		2		X
			Electrochemical methods of analysis lab	2	28	28			14	14		X
	Sommtion S5			30	413	413	161	89	14	163		

Semester 6

Year	Semester	UNIT	Courses	Credit	Workload	Assimilation	Workload division			PPW	EVALUATION	
							Course	DW	PW		CC	RM
3	2		STAGE	30	450					450		
	Sommtion S6			30	450		0	0	0	450		

According to the Self-Assessment Report, the following **specific learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Physico-Chemical Analysis and Environment:

✧ **Foundational Knowledge and Critical Thinking**

- **In-depth Understanding of Core Concepts:** Gain a comprehensive understanding of the fundamental principles in physico-chemical and environmental analysis.
- **Critical Evaluation of Scientific Literature:** Develop the ability to critically assess scientific research and methodologies in the field.
- **Advanced Theoretical Knowledge:** Build advanced knowledge in key areas such as analytical chemistry, environmental science, and material sciences.
- **Interdisciplinary Integration:** Integrate knowledge from related disciplines to form a holistic understanding of environmental issues and solutions.

✧ **Strong Problem-Solving and Analytical Skills**

- **Advanced Analytical Techniques:** Master the use of sophisticated analytical techniques and instruments used in physico-chemical and environmental analysis.
- **Data Interpretation and Statistical Analysis:** Develop skills in interpreting complex data sets and performing statistical analyses to derive meaningful conclusions.
- **Innovative Problem-Solving:** Cultivate the ability to design and implement innovative solutions to complex environmental problems.
- **Laboratory and Field Work Proficiency:** Gain proficiency in conducting precise and accurate experiments both in the laboratory and in the field.

✧ **Applied Skills and Professional Practice**

- **Practical Application of Theories:** Apply theoretical knowledge to real-world scenarios through practical projects and case studies.
- **Environmental Monitoring and Assessment:** Develop expertise in monitoring and assessing environmental quality using advanced techniques.
- **Regulatory and Compliance Knowledge:** Understand and apply relevant environmental regulations and compliance requirements.
- **Sustainable Practices:** Promote and implement sustainable practices in physico-chemical and environmental analysis.

✧ **Communication, Collaboration, and Professional Development**

- **Effective Communication:** Enhance written and oral communication skills for effectively conveying scientific information to diverse audiences.
- **Team Collaboration:** Develop strong teamwork skills through collaborative projects and interdisciplinary research.
- **Professional Networking:** Build a professional network through interactions with industry experts, academic peers, and participation in professional organizations.
- **Continuous Learning and Development:** Foster a commitment to lifelong learning and professional development to stay current with advancements in the field.

	Specific Competencies	
F1 (C Family 1) Scientific and technical tools	SLo1	Master the scientific tools and advanced fundamental subjects
	SLo2	Master and mobilise innovative technological tools in chemistry
F2 (C Family 2) Mastery the technical skills of the profession	SLo3	Designing and implementing methodologies for analysing and characterising substances of different origins
	SLo4	Conception and implementation of processes for water treatment and desalination plants
	SLo5	Master and valorisation of renewable and sustainable energy sources of residual waste
	SLo6	Experimenting, testing and validating physico-chemical analysis systems in industrial installations
	SLo7	Designing and dimensioning depollution installations in conformity with safety and normative standards
	SLo8	Concepting, piloting, and optimizing industrial process parameters to respect the environment.
F3 (C Family 3) Mastery of management and communications tools	SLo9	Master of languages and communications techniques
	SLo10	Master of managerial aspects, culture and industrial openness
F4 (C Family 4) Personal development, innovation and projects competencies	SLo11	Personal research and self-development, entrepreneurial initiatives and soft skills

0 Appendix: Programme Learning Outcomes and Curricula

The following **curriculum** is presented:

Semester 1

Unit	Courses	Credits	Workload	Assimilation	Workload division				EVALUATION	
					Course	DW	PW	PPW	CC	RM
UEF: Spectroscopic analysis method	Molecular Spectroscopy	3	49h	49h	21h	14h	14h			X
	Atomic Spectroscopy	3	42h	42h	21h		14h	7h		X
UEF: Analytical Chemistry	Analytical Chemistry	6	84h	84h	21h	21h	21h	21h		X
UEF: Separation and Chromatography analysis and Analysis method of solids	Separation and Chromatography analysis	3	49h	49h	21h	14h	14h			X
	Analysis method of solids	3	49h	49h	21h	14h	14h			X
UET: Quality, Environment, health and Safety	Standards and quality	3	32h	50h	21h			10,5h		X
	Health, Safety and quality	3	32h	50h	21h			10,5h		X
UEO: Chemical engineering and energy efficiency	Chemical engineering	3	32h	50h	21h			10,5h		X
	Energy efficiency	3	32h	50h	21h			10,5h		X
Global / Semester 1		30	401H	473H	189H	63H	77H	70H		
Percentages / type of Workload			100%		47,1%	15,7%	19,2%	18%		

Semester 2

Unit	Courses	Credits	Workload	Assimilation	Workload division				EVALUATION	
					Course	DW	PW	PPW	CC	RM
UEF: Air pollution control and environment management	Air pollution control	3	35	55	21	14				X
	Environment management	3	21	70	21					X
UEF: Electrochemical analysis methods	Electrochemical analysis methods	6	56	50	21	14	21			X
UEF: Environment analysis	air analysis and soil and sediment	3	49	49	21	14	14			X
	analysis of water and water effluents	3	49	49	21	14	14			X
UET: English, Communication technics and tutored project	English and communication technics	4	42	65		42				X
	Tutored project	2	21	40		21				X
UEO: Process engineering and petrochemicals	Process of engineering	3	21	70	21					X
	Petrochemicals	3	21	70	21					X
Global / Semester 2		30	315 H	518H	147H	119H	49H	0H		
Percentages / type of Workload			100%		46,7%	37,8%	15,5%			

Semester 3

Unit	Courses	Credits	Workload	Assimilation	Workload division				EVALUATION	
					Course	DW	PW	PPW	CC	RM
UEF: Physico-chemical analysis	Physico-chemical analysis of medicines	3	35	55	21		14			X
	food analysis	3	35	60	21		14			X
UEF: Water and solid waste treatment	water and wastewater treatment	3	49	49	21	14	14			X
	treatment and valorization of solid wastes	3	35	54	21		14			X
UE: Materials analysis	Organic materials analysis	3	42	55	21		14	7		X
	Inorganic materials analysis	3	42	56	21		14	7		X
UET: Metrology and entrepreneurship	Metrology	3	21	70	21					X
	Entrepreneurial	3	21	72	21					X
UEO: Renewable energy and catalysis - Green chemistry and sustainable development	Renewable energy and catalysis	3	21	75	21					X
	Green chemistry and sustainable development	3	21	69	21					X
Global / Semester 3		30	322H	615H	210H	14H	84H	14H		
Percentages / type of Workload			100%		65,3%	4,3 %	26,1%	4,3%		

Semester 4

Unit	Courses	Credits	Workload	Assimilation	Workload division				EVALUATION	
					Course	DW	PW	PPW	CC	RM
Global / Semester 4		30	450H					450H		
Percentages / type of Workload			100%					100%		