ASIIN Seal & EUR-ACE Label

Accreditation Report

National Engineering Diploma Programmes
Chemical Engineering
Civil Engineering
Mechatronics Engineering

Provided by
Université Libre de Tunis

Version: 24 March 2023

Table of Content

A About the Accreditation Process

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for [1]	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)[2]
Diplome National d'Ingenieur Génie Chimique	National Engineering Diploma in Chemical Engineering	ASIIN, EUR-ACE® Label	-	01, 09
Diplome National d'Ingenieur Génie Mécatronique	National Engineering Diploma in Mechatronics Engineering	ASIIN, EUR-ACE® Label	-	01, 02
Diplome National d'Ingenieur Génie Civil	National Engineering Diploma in Civil Engineering	ASIIN, EUR-ACE® Label	-	03

Date of the contract: 18 August 2020

Submission of the final version of the self-assessment report: 16 March 2021

Date of the online discussions: 28-30 April 2021

at: online discussions (due to Covid-19 pandemic)

Peer panel:

Prof. Dr. Jens Hartung, University of Kaiserslautern

Prof. Dr. Dirk Dahlhaus, University of Kassel

Prof. Dr. Renatus Widmann, University of Duisburg-Essen

Dr. Julia Schmidt, BASF SE, Ludwigshafen (industry representative)

Melek Chaabouni, International Institute of Technology (student representative)

[1] ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes

[2] TC: Technical Committee for the following subject areas: TC 01 - Mechanical Engineering/Process Engineering; TC 02 - Electrical Engineering/Information Technology; TC 03 - Civil Engineering, Geodesy and Architecture; TC 09 – Chemistry.

Representative of the ASIIN headquarter: Arne Thielenhaus
Responsible decision-making committee: Accreditation Commission for Degree Programmes
Criteria used: European Standards and Guidelines as of May 15, 2015 ASIIN General Criteria, as of December 10, 2015 Subject-Specific Criteria of Technical Committee 01 - Mechanical Engineering as of December 9, 2011 Subject-Specific Criteria of Technical Committee 03 - Civil Engineering, Geodesy and Architecture as of December 9, 2011 Subject-Specific Criteria of Technical Committee 09 - Chemistry as of March 29, 2019

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF[3]	d) Mode of Study	e) Double/Joint Degree[4]	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Ingeniérie Chimique	National Diploma in Chemical Engineering	-	7	Full time	Optional Double-Degree with Polytechnique Institute of Braganca	6 Semester	180 ECTS	SEPTEMBER /2012
Ingeniérie Mécatronique	National Diploma in Mechatronics Engineering	-	7	Full time	Optional Double-Degree with Polytechnique Institute of Braganca	6 Semester	180 ECTS	SEPTEMBER /2001
Ingeniérie Civil	National Diploma in Civil Engineering	-	7	Full time	Optional Double-Degree with Polytechnique Institute of Braganca	6 Semester	180 ECTS	SEPTEMBER /2001

For the National Diploma degree programme Chemical Engineering, the institution has presented the following profile in the self-assessment report:

„Train engineers mastering both the basic foundations of theoretical chemistry (organic, inorganic, quantum chemistry, etc.) and the application of these concepts on an industrial scale through the design and development of industrial units.

The acquisition of the analytical theoretical knowledge's and hands on skills through lab experiment will help engineering students to bring their knowledge within a research laboratory by carrying out physico-chemical analysis and also within industrial units through the optimization and maintenance of material transformation units.

Graduates will be able to:

1. Succeed in the practice of chemical engineering in fields such as chemicals, polymers/ advanced materials, food processing, pharmaceuticals, biotechnology, or environmental engineering;

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

[4] As agreed with the University Libre de Tunis, the double-degree options are not part of the accreditation, as this must be agreed upon within the framework of the contract. They are therefore not extensively analysed in this report and the name of the partner institution will not appear on any issued certificates.

2. Assume leadership roles in industry and/or in technological fields and contribute to the socio-economic environment of their communities;
3. Further develop career skills through life-long learning. “

For the National Diploma degree programme Mechatronic Engineering the institution has presented the following profile in the self-assessment report:

“The main objective of the degree programme is to produce graduates capable of carrying out problem analysis, system design, and implementation. They are able to ensure that products, systems, machines and industrial facilities respond to the technical specifications.

As far as the curriculum integrates the principals of mechanical engineering, electronics, computer engineering, telecommunications engineering, systems engineering and control engineering, graduates in Mechatronics Engineering will practice in a multidisciplinary environment, they will be able to:

1. Design, Develop Product and applications in the field of Mechatronics Engineering and be able to use Engineering Tools that will Enhance their Productivity.
2. Be Effective Engineers with Good Analytical and Problem Solving Skill to Innovate, Research and Develop in a Multidisciplinary Environment.
3. Adapt, to adjust, to grow independently as well as to compete globally.
4. Develop the chosen field, including the ability to continue to post-graduate studies.”

For the National Diploma degree programme Civil Engineering the institution has presented the following profile in the self-assessment report:

„The Department of Civil Engineering, has for mission to train engineers in civil engineering capable, to take care of the design, the realization, the operation and the rehabilitation of construction works and infrastructures of which they assure management to meet the needs of society, while ensuring public safety and protection of the environment.

Civil Engineering graduates will be able to:

1. Utilize their skills to analyse and design systems, specify project methods and materials, perform cost estimates and analyses, and manage technical activities in support of civil engineering projects.

2. Be engaged in life-long learning, including studies leading to professional licensure and professional expertise, and post graduate studies.

3. Understand professionalism, ethics, quality performance, public policy, safety, and sustainability that allows them to be professional leaders and contributors to society.“

C Peer Report for the ASIIN Seal[5]

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Self-Assessment Report (SAR)
- University website
- Diploma Supplement

Preliminary assessment and analysis of the peers:
Intended learning outcomes (ILOs) for the degree programmes Chemical Engineering, Mechatronics Engineering and Civil Engineering are indicated in the self-assessment report (SAR) and the respective module handbooks. However, while the list in the module handbooks are divided into knowledge, skills and competences, the lists in the SAR are different and appear to combine all three. The University website also indicates some programme objectives, which differ from the two lists above.

Overall, it is apparent that the learning outcomes have been adapted to each programme. They appear to be viable and coincide with the subject-specific criteria (SSC) of the relevant technical committees. Furthermore, they are consistent with the EUR-ACE requirements for engineering programmes. However, it is not clear which set of ILOs is binding – this must be clarified by the University. Furthermore, ILOs must be communicated consistently.

Knowledge, skills or competences related to scientific research are not listed among the intended outcomes. The University makes clear during the audit discussions that the students are being prepared to work in industry and that the curricula therefore focus heavily on teaching practical skills rather than research.

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

During the online discussions, it is revealed that the coordinators of each programme meet annually to determine whether the ILOs or the course contents require any adjustment. During the course of the year, the coordinators gather feedback from different stakeholders, including students and industry representatives, which is discussed during this annual meeting and is in some cases transformed into concrete improvement measures.

While there appears to be a satisfactory exchange with stakeholders concerning the ILOs, the University must submit evidence that ILOs are consistently communicated and made transparent in the diploma supplements, on the website and / or in other binding documents.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report
- Diploma Supplements
- Cooperation agreement with the University of Braganca

Preliminary assessment and analysis of the peers:
The peers are under the impression that the degree programme names as indicated in the official documents as well as their English-language translations reflect in most but not all instances the programme contents and intended learning outcomes. There is some concern that the English programme names are not used consistently. For instance, the programme referred to as Chemical Engineering in the SAR is referred to as Chemistry Engineering in a cooperation agreement with the University of Braganca. The University should clarify which is the correct English name for the programme and must ensure that it is used consistently. submit official documents (ex: Diploma Supplements) for each programme, containing both the official programme names and translations. This is particularly important for comparing qualification of graduates from other universities offering study programmes with identical titles but considerably different curricula, such as Master-degree programmes in Chemical Engineering provided from several technical universities.

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Module descriptions

- Curricula

Preliminary assessment and analysis of the peers:
The curricula for the three study programmes are provided in both the SAR and the annexes. Module descriptions are provided for all three programmes, indicating the intended learning outcomes for each module.

As is required by Tunisian law, the curricula for the National Engineering Diploma study programmes have a length of 6 semesters. Students begin the "Engineering Cycle" after having completed either a 3-year "licence" or a 2-year "préparatoire" programme.

The courses in the programmes are organised into five categories, including Science & Technology, Professional, General, Workshop & Practice, and Internship. During the discussions, the University notes that the first year of the study programmes focuses on fundamentals and that the subsequent semesters become more specialised. There are compulsory internships of 1-2 months in the second and third year, and the programmes end with a Graduation Research Project, which includes an internship, thesis and defence.

With regards to the Civil Engineering curriculum, the peers are of the opinion that the courses sufficiently cover the most important contents, that these enable the students to achieve the general ILOs and are in line with the ASIIN SSC and EUR-ACE engineering criteria.

Concerning the Chemical Engineering study programme, the peers have the impression that the Master-curriculum consists almost exclusively of Chemistry courses, of which the majority are basic courses generally found in Bachelor-degree study programmes. Many if not most of the contents appear to be more consistent with the Bachelor level. This is indicated by the focus on individual groups of molecules, such as carbohydrates, 2-aminocarboxylic acids, or fatty acids. The expert panel would expect a Master-level programme with a focus on Chemistry to dive deeper into Chemistry-related specialisations. Natural product chemistry, for instance, would involve covering combining principles of self-constitution, systematics of secondary metabolites, carbon metabolism, and intrinsic chemical reactivity encountering enzyme-guided selectivity. The same arguments apply for advanced physical chemistry (spectroscopy courses would cover quantum physics and higher mathematics), medicinal chemistry (pharmacology discussion would involve stereoselective synthesis, biology and physiology), synthesis (physical organic chemistry would involve advanced modelling and transition metal catalysis), chemical technology (physical chemistry and physics would cover environmental chemistry and food technology), and so on.

From the engineering perspective, modules allowing students to analyze, plan, design and optimize on a scientific basis (verification and falsification) engineering products, processes

and systems within a broader multidisciplinary context at the forefront of an individual field of specialisation are missing. Main-stream study programmes in Chemical Engineering at major technical universities include an extended (up to six weeks including a seminar for developing theoretical backgrounds) course in project management, allowing graduates to develop competences in knowledge and understanding in process and plant engineering, engineering analysis and engineering design with the aim to conceptualize engineering products. Examples of topics currently in the curriculum which commonly are not part of Master-programmes in Chemical Engineering include food- and scent-chemistry, quantum chemistry, stereoselective synthesis and organometallic chemistry.

The University explains that the broad approach aims to prepare students for a variety of sectors related to Chemical Engineering. While the discussions with local industry representatives suggest that the programme meets local demands, the peers are of the opinion that the overall curriculum in the Chemical Engineering program is not in line with the ASIIN SSC and EUR-ACE criteria. If the University wishes to pursue an engineering focus, which the title suggests, Master-level engineering contents at the interface of chemical engineering and plant engineering must be integrated. Should a focus on Chemistry be desired, Master-level treatment of specialised subject-areas must be integrated, and a change of the programme name considered.

For both Civil Engineering and Chemical Engineering, the module descriptions indicate that certain contents are repeated in different modules in order to refresh students' memory. When asked during the online discussions, the students report that they do not feel that many topics are unnecessarily repeated – this therefore does not appear to be a significant problem. Nonetheless, instead of covering the same course material in different modules, the peers encourage the University to leave repetition to the students and dedicate the gained time to new contents, such as electives or training of enhanced practical competences in individual research projects on a deeper scientific basis.

With regards to the Mechatronics curriculum, the peers note that many topics are covered, but are unable to find some key topics, such as for example Linear System Theory and Constrained Optimisation. As in the other programmes, certain contents appear to be repeated: a fourth-semester workshop covers Internet of Things (IoT), while in the fifth semester, additional IoT theory is provided. Module 5.4 appears to repeat many aspects related to the Linux OS which are already discussed in the Module 2.4. The Robotics 3 module contents appear to be very similar to the contents of the Robotics 2 module. Furthermore, a number of modules include, as prerequisites, modules which do not take place until later in the curriculum. The University should review and revise the module descriptions with the goal of creating a reliable source of information for students, and should furthermore ensure that the prerequisites are in alignment with the module order. As with the other

programmes, the University is encouraged to not repeat contents in different modules. It must also ensure that crucial topics such as Linear System Theory and Constrained Optimisation receive sufficient attention in the Mechatronics Engineering curriculum. For the moment, the Mechatronics programme currently does not fulfil the ASIIN SSC and EUR-ACE requirements.

During the online discussions, the peers ask about the integration of Ethics in the curriculum. The University notes that some courses discuss relevant laws. A speech which included the subject of Ethics was also given by a minister at an event hosted by the University. While such occasional talks by visiting experts can be very valuable, the programmes could benefit even more if Ethics constituted a fixed component of one or more modules. This would ensure that all students in the programmes are exposed to this important matter via integrated courses, rather than on a voluntary basis.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Report
- University website: https://www.ult-tunisie.com/conditions-dadmission/

Preliminary assessment and analysis of the peers:
The admission requirements are indicated in the SAR and on the website. As is required by Tunisian law, students entering all engineering programmes must have previously completed either a three-year “license” in Science and Technology or a two-year preparatory cycle. Applications go through the University website. Students are subsequently selected based on their application and an interview. The final decision concerning each candidate is made by the department head on the basis of an Admission Evaluation Form prepared by the Admission Office. The peers note that the interview component is currently not mentioned in the admission rules published on the website, and must be made transparent.

Students are required to pay tuition fees. Those coming from outside of the Maghreb region must pay a higher tuition fee for compensating elevated administrative efforts by the University. Approximately 15% of students originate from outside Tunisia – in some cases from neighbouring countries, in others from sub-Saharan francophone African countries.

During the discussions, the peers learn that students who began their Engineering cycle at a different institution of Tunisia can transfer to ULT into the second year of studies. According to the University, the admissions process is the same as for students entering the programmes in the first year. While this may be the case, there do not appear to be formulated

rules and regulations for admitting external students to study programmes and recognition of credits. For transparency and to ensure consistent treatment of students, such rules should be fixed and published by the University. The rules for students who enter the study programmes as part of the double-degrees with the Polytechnique Institute of Braganca in Portugal (IPB) are well-regulated in the respective cooperation agreement.

Aside from the rules applying to transfers and the required interview, the admission requirements appear to be transparent, binding and structured in a way that supports the students in achieving the learning outcomes.

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

In its response to the expert panel's comments regarding the learning outcomes, the University notes that students are primarily trained to work in industry. Together with teaching in-depth analytical, methodological and scientific competencies, the three engineering programmes have an engineering development and application orientation and not a basic research orientation. The University is of the opinion that the mathematical, analysis, simulation and experimental skills achieved by the students via the programmes also enable them to easily handle challenges related to design & development of new products. The University believes that its programmes successfully address local market demand for skilled and hands-on development engineers. It notes that, following the accreditation procedure, a Programmes Review & Evaluation Meeting was held to make changes based on the feedback from stakeholders and also the ASIIN Audit report. A revised set of module descriptions is submitted for each of the programmes.

Following a review of the website and the submitted diploma supplements, the peers are satisfied that the ILOs are now communicated consistently and in a binding format.

Regarding the English name of the Chemical Engineering programme, the University agrees that there was some inconsistent usage in the past. Some URL links as well as the diploma supplements are provided, indicating consistent usage. The peers are thus satisfied that consistent usage of the programme name is assured.

The University provides a lengthy response regarding the peers' comments concerning the curricula, which includes for each programme a list of curricular changes and corresponding adjusted module descriptions.

The University notes that projects as well as the subject of ethics were added in all three programmes. The peers view this positively.

For the Chemical Engineering programme, the University notes that, as in France, the Tunisian curriculum is built on the basis that engineering students have previously completed 2 years of preparatory cycle (*cycle préparatoire*) and did not have basic chemistry courses. As a response to the expert panel's comments and feedback, the University supplies a separate document with an extensive list of proposed curricular changes as well as the corresponding adjusted module descriptions. The panel recognises that a number of modules have been substituted and others shifted. The majority of modules, however, corresponds to those submitted in the original application for accreditation. Furthermore, the proposed changes adhere in depth to the level of original modules rather than shifting to more demanding master-level modules.

With regards to the engineering contents in the Chemical Engineering curriculum, the experts are of the opinion that these are still not sufficiently represented. The peers note that ULT has suggested additional project-related courses specified by "Project" in the title, for example, "Product Design Project" or "Annual Project". In addition, a Project Management course was introduced. The peers see these suggestions as a move in the right direction, but note that the limited length and depth of these courses (1.5-2 ECTS) are not sufficient in order to develop the students' ability to independently manage engineering projects. Ideally, students would work in groups to analyse a complex problem, make a project plan to solve it and also develop the solution, i.e. they would carry out a project from start to finish. This could involve the tackling of real-world problems from industry partners in a variety of Chemical-Engineering fields (ex: Bioprocess Engineering, Industrial Electrochemistry, etc.). With the introduction of such a module, the peers believe that a good balance between "chemistry" and "engineering" could be achieved. The peers note that this type of project-module would require the dedication of a significantly larger workload than is currently the case.

The expert panel concludes that the proposed curricular fall short of ensuring that the students achieve knowledge and competences adequate for the Master-level and in line with the ASIIN SSC and EUR-ACE requirements. It must be demonstrated on the basis of revised subject content and current master's theses that the intended qualification goals at level 7 of the EQF are achieved and that the students acquire the necessary scientific competences. The manner in which this is achieved is entirely up to the University, but depending on the available teaching capacity, one possible option could be to offer specialisations in different fields and dive deeper into the respective subject areas.

For the Mechatronics Curriculum, the University proposes adding Linear System Modelling Theory as well as Constraint Optimisation. The revised curriculum proposes rearranging modules with the aim of ensuring a consistent and logical progression in terms of course contents. Some contents were also adjusted to avoid repetition. Unfortunately, these

changes do not alleviate the expert panel's concerns. In particular, the math courses appear insufficient, not properly aligned and taught at the wrong instance of the curriculum. In the Module 'Linear System Regulation & Servo Control', for instance, there appear to be limited contents concerning linear system theory. In the opinion of the peers, the treatment of convolution integrals and generalized functions, so-called "functionals", is missing. Neither analysis nor generalized functions appear to be taught anywhere in the curriculum. This makes it practically impossible to be able to follow the contents and to apply the taught approaches and methods with a deep understanding in a professional environment. It is noted that 'Linear system modelling' is a different topic (typically derived using concepts from spectral estimation etc.). It is noted that a little linear algebra is taught in the module 'Introduction to Mechatronics Systems', yet only those aspects required to understand robotics, not linear algebra in general, like e. g. in infinite dimensions as required for linear system theory. Linear algebra is also offered as part of the module 'Artificial Intelligence', but only in year 3. While it appears that students are taught how to solve differential equations, there appears to be no treatment of the underlying theory (i.e. what differential equations are). The expert panel also does not find any mathematical contents related to analysis or series expansions, which are everyday tools in engineering.

Concerning the inclusion of constrained optimisation methods, the problems are similar as with linear system theory. Standard constrained optimisation schemes, in particular convex optimisation, are based on a profound knowledge in linear algebra, which is not foreseen in the curriculum in the second semester.

Due to the lack of a solid mathematical foundation, the expert panel is therefore under the impression that the ASIIN SSC and EUR-ACE requirements are not fulfilled and that a Master level is not achieved. As with the Chemical Engineering curriculum, it must be demonstrated on the basis of revised subject content and current master's theses that the intended qualification goals at level 7 of the EQF are achieved and that the students acquire the necessary scientific competences.

Regarding the admission criteria, the University indicates that the University rulebook has been updated and now includes rules concerning the admissions in the second year and a reference to the required interviews. The peers approve of these regulations but note that the University must submit evidence that these have been published and are easily accessible to students.

Criterion partially fulfilled.

2. The Degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Self-Assessment Report
- Annex on Partnerships and Student Mobility
- Module descriptions
- Learning Agreement and Agreements for the Award of a Master Double Degree

Preliminary assessment and analysis of the peers:
As is indicated by the provided module descriptions and curricula, the programmes are divided into modules which span at most one semester.

Based on the discussions with the students and teachers, the curriculum is structured in a way to allow students to complete the degree without exceeding the regular course duration. As indicated by the provided statistics, the vast majority of students complete the programmes in the suggested time. They may however take up to two extra semesters to complete their studies. The University indicates that students who miss a semester or a year due to sickness or other special circumstances, may also receive additional time - however, there are no fixed rules for these types of situations. For transparency reasons, the University should fix rules for such circumstances and publish them – in this manner, a consistent treatment of students is ensured.

The programmes contain three internships, including two one-month internships which must be completed during summer vacation, after years one and two, respectively. The final internship is part of the final graduation project, which takes place in the final semester. Before the students begin, the internships must be approved by the respective department head with regards to relevance and adequacy. The first two internships are not credited – this is further discussed under criterion 2.2. During the discussions, the students indicate that the University could facilitate the internship search by providing a database of companies at which ULT students had previously completed internships. The expert panel passes this suggestion on to the University for consideration – overall, the panel believes the internships are beneficial, providing students with practical experience and helping them achieve the ILOs.

With regards to mobility, a list of students' experiences abroad is provided and indicates that a fair number of students participate in exchanges related to graduation research projects at Universities in Europe and Canada. All three programmes also include a double-degree option, where the final year is spent at the Polytechnic Institute of Braganca. This is positively viewed by the peers, particularly since the students also provide positive feedback during the discussions. Based on the provided student feedback and the learning agreements the peers are under the impression that all mobility options are well-integrated and allow students to finish their studies on time. Concerning credit transfer, it is noted that some modules contain workloads with half-credits (0.5 ECTS credit points) – these can cause problems in situations where the student wishes to transfer credits to another institution, and should therefore be avoided. As previously mentioned under 1.4, there are no clear rules for the transfer of credits from other institutions – these must be formulated and published.

In light of the students' interest to gather experience abroad, it is recommended that the University include additional English-language contents in the curriculum, beyond the contents provided in the English-language courses. During the discussion rounds it is indicated that the teaching staff in many cases does not possess a sufficient level to teach in English. As indicated by the industry representatives, however, a mastery of English is particularly important for graduates from the fields of Chemical and Mechatronics Engineering, and an effort could be made to improve the teaching staff's abilities in this area. Such contents could include English-language lectures, course material, exams, etc., and could also help students prepare for their mobility experiences abroad.

While students are able to define an individual focus and course of study via internships and mobility experiences, the curricula for the three programmes do not include, with the exception of the double degree options, any electives or specialisation areas. At the same time, each curriculum addresses a large number of different fields within the subject area. For instance, all Mechatronics Engineering students must participate in a module concerning automotive quality standards. As revealed during the discussions, only 30-50% of graduates enter the automotive sector. Some of the interviewed students indicate that they would welcome the opportunity to specialise in different areas.

The expert panel is of the opinion that the University should take measures to facilitate specialisation and must provide students with more opportunities to choose their own path. By providing specialised modules, students will also have the opportunity to learn about subjects in greater detail than is currently the case. Due to the large number of subjects in the current curricula, many subjects can only be touched upon superficially.

Criterion 2.2 Work load and credits

Evidence:

- Module descriptions
- Self-Assessment Report
- Online discussions
- Course schedules (Emplois du temps)

Preliminary assessment and analysis of the peers:
As previously mentioned, each semester has a workload of between 700 and 800 hours. The provided documentation indicates that the University uses the European Credit Transfer System (ECTS), and that each semester should have a workload of 30 ECTS credit points. Contact- and self-study hours for each module are indicated in the respective module description. However, the descriptions reveal that for many modules, the number of hours per credit point has been calculated at 21 hours, or in some cases 38 hours, so that the ECTS User Guideline of 25-30 hours per credit point is not upheld. Furthermore, the amount of self-study hours appears to be estimated based on the number of contact hours, without any additional verification taking place. The peers also learn that the two compulsory internships in the second and third years are currently not credited.

Following the discussion with students and the review of the course schedules, the experts are under the impression that the number and distribution of the courses result in an adequate workload. As indicated under criterion 3, they ask the University to provide (in addition) sample examination schedules.

The University must submit evidence that the documentation has been adjusted in accordance with the ECTS User Guidelines, and that a system is in place by which the number of self-study hours is checked, for example via student surveys at the module level. The University must furthermore provide evidence that the compulsory internships are credited.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report
- Module descriptions

- Curricula

Preliminary assessment and analysis of the peers:
The teaching methods for the programmes are described in the SAR as well as in the module descriptions. Based on the documentation, the peers initially gain the impression that the teaching methods focus on lectures and practical lessons, e.g. lab work. During the discussions with the University, it is revealed that the courses marked as "lectures" in some cases also include group projects, or may require students to give presentations to their fellow students. The peers note that these other teaching methods must also be indicated in the module descriptions. The module descriptions suggest that there is a balance between self-study and contact hours, although, as mentioned under criterion 2.2, the number of self-study hours presumably requires verification.

With regards to independent academic research and writing, the peers learn that the University provides students with guidelines how to write scientific papers. The peers have the opportunity to review some sample final graduation projects, including some which were completed at IPB as part of the double-degree option. All graduation projects seem to focus primarily on practical problem solving and do not include noteworthy examinations or discussions of relevant theory. As will be discussed under criterion 4.3, students also do not have access to scientific databases beyond those that are freely available on the internet, further limiting their ability to conduct academic research. A number of students in the discussions express interest in pursuing a PhD; in order to enable them to do so, the University must place a greater emphasis on academic research and writing.

In conclusion, the peers would welcome the introduction of additional teaching methods (ex: seminars) which may lead to more discussions and a greater exchange of ideas. Currently, familiarising students with independent academic research and writing does not appear to play a vital role in the programmes, and the University must make adjustments accordingly.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Report
- Online discussions

Preliminary assessment and analysis of the peers:
As revealed in the SAR, there are a number of general support services offered to students. For example, international students are assisted in addressing administrative issues and with finding housing. A help desk and call centre is also available to answer various questions related to student life. There are also a number of student clubs.

With regards to academic support, the students report that they rely on direct contact with their teachers. In this regard, the small class sizes are advantageous, allowing students and staff to form stronger relationships. It appears that the relationship between teachers and students is respectful, helpful and esteeming, and that sufficient resources are available to provide students with individual assistance, advice and support.

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

The revised rulebook provided by the University indicates that the maximum study period is 4 years. The peers note that no reference is made to additional extensions for special circumstances such as sickness – they therefore expect that the University will not make any exceptions to this rule. The requirement to publish this rulebook was already discussed under criterion 1.

The University believes that the internships and research projects give the students sufficient freedom to specialise in areas that interest them, additional specialisation opportunities are provided by student clubs and associations as well as study abroad opportunities. The expert panel maintains that the current rigid structure gives the students insufficient opportunities to choose their own course of studies. While the students take many courses, they have limited opportunity to dive deeper into the various subject areas. Study abroad opportunities are utilised by a minority of students. The expert panel firmly believes that the students' study-related choices cannot be limited to internships or extra-curricular clubs and associations. It therefore requires the integration of electives in the curricula.

The University indicates in its response that it will introduce some additional English language contents in the curricula. For example, the Computer Science 4 unit in the Mechatronics programme will be taught in English. The peers view these plans positively and recommend their implementation.

The University also indicates that new students will be encouraged to register at a nearby languages centre for additional English classes. While this cannot hurt, the expert panel believes that the students will be more likely to improve their English language skills if appropriate courses are offered by ULT itself, and therefore encourage ULT to increase its own offerings.

The University indicates that changes have been made to adjust the distributed credits and workload in accordance with the ECTS User Guideline that 1 ECTS credit is equal to 25-30 hours. The University also indicates that it will conduct anonymous student surveys to determine whether the estimated self-study times are in fact accurate. The expert panel ap-

proves of these measures but notes that the University must submit evidence that the surveys have been implemented and that any discrepancies thereby discovered have been resolved.

The University indicates that the required internships in the first and second year have now been credited with 5 ECTS each. The peers approve of this.

The University notes that half-credits (0.5 ECTS credits) must for the time being remain in use due to previous accreditation by the Tunisian Ministry of Education. The peers nonetheless encourage the University to switch to using only full ECTS credit points as soon as possible.

The University also provides sample exam schedules which indicate that, depending on the number of subjects in that semester, the students take 8-12 final exams, each with a length of 1.5 hours, over a time-span of 2 weeks. The peers note that the vast majority of students seem to pass the exams, nonetheless the University could consider spacing the exams across a longer time period.

With regards to teaching methods, the University indicates that students can choose to complete their graduation research project either at a research institute or with an industry partner, depending on whether they prefer to have a research or practical orientation. The University suggests that only a small proportion of top-performing students are generally interested in pursuing a PhD. While this may be true, the ASIIN criteria require that students' familiarisation with independent academic research and writing must play a vital role in the programme. It is clear that, for all three programmes, this is currently not the case. The University must therefore make adjustments to ensure that the curricula dedicate sufficient time so that students can acquire the related competencies. This includes an adequate examination and discussion of relevant theory in graduation projects.

Criterion partially fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-Assessment Report
- Module descriptions

- Examination regulations
- Emploi du temps
- Online discussions

Preliminary assessment and analysis of the peers:
The exam methods are indicated in the respective module descriptions, and it is therefore clear that each module has an exam. Based on the samples provided for each study programme, the expert panel can see that the exams are module-related and offer students feedback on their progress in developing competences.

The exams consist almost exclusively of written formats. Even practical courses seem to be predominantly examined by written tests, although focus in these teaching units is based on practical competences and learning of practical techniques. An oral exam format is only utilised in the students' defence of their final thesis. A three-person jury evaluates the student during the presentation of his or her thesis defence. During the online discussions, the University indicates that the oral exam format is untypical for Tunisia and that it is therefore seldom employed. However, as previously mentioned under criterion 2.3, students do in some modules give ungraded presentations. The peers recommend that oral exams be used more frequently, as these more comprehensively test students' knowledge, and also prepare students for their final thesis defence. Furthermore, the University may consider using practical exams for practical courses.

Based on the discussions with the students and teachers, there is a large number of examinations per semester, particularly when considering additional midterm exams specified in nearly every modul. The University notes that the mid-term exams do not impact the grade but allow the students to see their progress. The peers ask the University to provide sample exam schedules for each programme.

The final graduation projects were already discussed under criterion 2.3.

The examination regulations include rules for disability compensation measures, illness and other mitigating circumstances. However, the provided documentation does not include rules for resits – the University should indicate where these can be found.

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

The University indicates that oral presentations have been added as an examination format in some modules that include workshops or projects. The peers approve of this.

The expert panel is furthermore satisfied that rules about resits are included in the revised rulebook. The requirement to publish the rulebook was already discussed under criterion 1.

Criterion fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-assessment Report
- Staff handbook
- Online discussions

Preliminary assessment and analysis of the peers:
The composition of the teaching staff is indicated in the SAR and consists of core faculty members, adjunct faculty members and lecturers and professionals. Core faculty members are members employed by ULT full-time while adjunct faculty members primarily teach at other institutions and in part-time at ULT. While most of the core staff members are young, experience is contributed by adjunct staff members. An overview of the teaching staff numbers is presented in the table below.

Category	Statistics			Rank/Position
	Chemical Engineering	Civil Engineering	Mechatronics Engineering	
Core Faculty Members	7	5	6	Assistant Professors Assistants & PhD Candidates
Adjunct Faculty Members	18	22	22	Professors Associate Professors Assistant Professors
Lecturers & Professionals	7	9	6	-Engineers -Directors -Retired Professionals
Total	***32***	***36***	***34***	

During the discussion round with the University leadership, it is indicated that the institution's focus is to prepare students for work in industry. As a result, most of the teaching staff dedicates little time to research. In some cases, research cooperation takes place with businesses, generally in order to solve specific problems. As previously discussed, the examined student work samples show deficiencies with regards to academic research and writing – the University must ensure that the teaching staff can effectively develop competences in academic reading and writing among the students. Increasing the research focus of the teaching staff would presumably lead to improvements in this area.

Following the discussions with the students, there appear to be enough administrative staff members to provide students with assistance and to complete administrative tasks. With regards to teaching staff, as revealed during the discussions, the workload per teaching staff member can be considerable. At the same time, it is difficult to find qualified teaching staff, particularly staff which is able to teach in English – most of the current staff members are unable to do so. The expert panel shares the teaching staff's estimate that, while the current staff resources are able to sustain the programmes, additional full-time teaching staff would be advantageous – this could increase the University's research capacity, bring in new skills and reduce risk in case a teacher falls ill. In the Mechatronics Engineering curriculum, for instance, a fair number of modules are taught by one teacher.

Criterion 4.2 Staff development

Evidence:

- List of teaching staff training sessions
- List of outgoing staff mobility experiences
- Online discussions

Preliminary assessment and analysis of the peers:
As indicated in the SAR, the University aims to support the continuous academic development of their staff via domestic and overseas training. As indicated in the provided list, in the last years staff members have participated in training related to soft skills & pedagogy, software, industrial systems safety and a variety of other areas. Staff mobility programmes are supported by the Institute and funded by several organizations (ERASMUS+, DAAD, Host Institution Exchange). Lecturers are allowed to apply for mobility abroad in the area of research, publication, or as guest lecturer or reviewer. The Institution continuously encourages the Academic Staff members to join national/ international seminars, symposiums, and conferences. A number of staff members have also been at IPB as part of the

double-degree related exchange. With regards to laboratory staff, safety training is provided by an external organisation.

Based on the provided evidence, it is apparent that are offers and support mechanisms available for teaching staff who wish to further develop their professional and teaching skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self-assessment report
- Safety instructions for laboratories
- Videos and photos of facilities
- Agreements with Polytechnical Institute of Braganca
- Online discussions

Preliminary assessment and analysis of the peers:
With regards to funding, the University indicates that this is secured for the time-span of the envisaged accreditation period via student tuition fees. A higher tuition fee is charged to students coming from outside of the Maghreb region, as there are additional costs associated administrative efforts and tasks. The University indicates that the tuition fees are sufficient to allow for investments in additional infrastructure. In case of a sudden drop in new students, the University can continue to finance the programmes with bank credit.

The University provides descriptions of the available equipment and facilities, as well as panorama 360-degree photos. After reviewing this information, the peers are under the impression that the available equipment and laboratories are adequate for achieving the ILOs. During the online discussions, the University provides additional information about safety equipment and related training and procedures. Helmets, protective foot-wear and safety vests are provided to students in the Civil Engineering Programme. The provided equipment and safety measures appear to be adequate.

For the Chemical Engineering Programme, all students must go through safety training, provided by an external training service, before they can enter the lab. Showers and different types of protective equipment (lab coats, eye protection, various glove types, etc.) are available. Chemicals are stored in areas with adequate temperature regulation. Students also receive written safety guidelines. Regarding international standards of laboratory safety, the peers however have the impression that labelling of hazardous laboratory

chemicals needs to be updated to the current H&P-standard. Also the peers are not convinced that students are sufficiently trained in writing operational guidelines prior to conducting laboratory experiments.

The University has a library as well as computer labs with specialised software. The University appears to be particularly well equipped with 3D simulation software. However, this software can only be used from these computer labs, so that only a limited number of students can use it at any one time. The peers encourage the University to invest in VPN or other technology which will allow the students to access this software from outside the University.

In this regard, the peers ask the University to indicate its plan for the coming years with regards to laboratory and equipment investments.

With regards to access to scientific literature, the University reports that, apart from the on-site library, students and teachers only have access to the databases that are freely available online. As indicated in the online discussions, the University does not offer access to paid scientific literature databases for cost reasons. There therefore appears to be insufficient access to scientific journals and articles, which provide teachers and students with vital insights about recent developments in their fields, and are key to familiarising students with academic research and writing. The University must therefore expand access to scientific literature.

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

The University indicates in its response that its future laboratory expansion plans will focus on setting up the fab lab, which will be accessible to students, staff, industry- and research partners. A separate document with a description of these plans is submitted along with the response. The adoption of a VPN solution to facilitate students' off-campus work is also being considered. This is viewed positively by the peers.

The University provides information concerning the labelling of chemical compounds, the storage of chemicals and chemical waste, and preparation of operational guidelines prior to conducting laboratory experiments. The provided pictures show that the storage facilities and utilised labelling systems for the chemical compounds are appropriate. However, based on the University's response, it appears that the students are not trained in developing operational guidelines. Rather, these are always prepared by laboratory technicians in coordination with the teacher. The peers note that, in order to build students' understanding and train them in the communication of complex content, it is very important that students are taught to theoretically analyse the experimental task and derive operational

and safety guidelines. The University must therefore ensure that the programme includes this type of training.

The University furthermore indicates that it plans to expand access to scientific journal databases like IEEEXPLORE. The expert panel views this positively but notes that the University must submit evidence that sufficient access to scientific journals is provided.

Criterion partially fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions
- Online discussions

Preliminary assessment and analysis of the peers:
English-language module descriptions which contain all necessary information are submitted by the University. A review of the recommended literature sections suggests that these should be updated with more recent titles and leading references. Also, as mentioned under criterion 2.3, the online discussions indicate that some module descriptions do not include all the utilised teaching methods.

While students can access some course information in the University's ERP system, the discussions indicate that the submitted module descriptions are not accessible to students, neither in English nor in French. Students are informed about course contents on the first day of a course, or may ask the department head in case they have questions about an upcoming course.

The University should submit revised module descriptions containing the missing information and ensure that all module descriptions are made available to students in the course language. Furthermore, the University is encouraged to update the recommended literature sections.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Diploma template
- Diploma supplement template
- Transcript of records

Preliminary assessment and analysis of the peers:
The University submits a Diploma Supplement template for the programmes. The supplement contains a diagram depicting the Tunisian education system. However, the peers find this diagram difficult to understand and are of the opinion that a more detailed description and clearer diagram should be included, aimed at readers who are not familiar with the Tunisian education system. The supplement template furthermore does not contain a description of any of the study programmes and ILOs are also not included.

The provided transcript of records provides an overview of the courses taken, but does not explain the coefficients which are used for giving more weight to certain modules in the final grades. This aspect has to be clearly explained. Furthermore, no statistical data is provided which allows readers to categorise the individual result/degree (see ECTS User Guide).

The peers ask the University to submit a complete diploma supplement for each study programme, as it is given to students upon graduation. Furthermore, a description of the weighted grading system, as well as statistical data for the categorisation of the individual student's result relative to fellow classmates, must be included in the supplement or transcript of records, in a manner that is clear to third parties.

Criterion 5.3 Relevant rules

Evidence:

- University website
- Online discussions

Preliminary assessment and analysis of the peers:
As mentioned in previous sections, the peers believe that some rules are not clearly formulated (ex: rules for transfer from other universities) or made transparent. The university must develop binding rules and to make them transparent to students to ensure fair and consistent treatment.

Furthermore, it seems that important course information such as that provided in the module handbooks is not accessible to students. In several cases (ex: programme learning outcomes) information is communicated inconsistently on the website and in the provided

documents. The University must ensure course information is anchored in binding documents and is communicated consistently and transparently.

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

The University submits revised module descriptions along with its response. The peers approve of these, but note that the University must submit evidence that the module handbooks are made available to students in the course language.

The University provides a sample diploma supplement for each study programme, which also includes a table in which statistical data for the categorisation of the individual grade is to be provided. The peers note, however, that the tables in the English diploma supplements do not contain the translation – this must be adjusted by the University. They furthermore note that the submitted diploma supplements do not provide any information about the individual performance of the student. If the students' grade is to be delivered in a separate transcript, it would likely make more sense to include the table with the relative grade distribution there rather than in the diploma supplement. A revised transcript has not been provided, so it is also unclear whether the weighted grading system is now adequately explained. The University must make the mentioned adjustments and resubmit the diploma supplement and also resubmit the transcript featuring appropriate revisions.

As mentioned under criterion 1, the peers are now satisfied that course-related information, including the ILOs, are being communicated consistently. However, the revised rulebook must still be made available to stakeholders in the course language.

Criterion not fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment Report
- Survey results

Preliminary assessment and analysis of the peers:
As indicated in the SAR, the University is ISO certified and has implemented a number of Quality Assurance activities.

Satisfaction monitoring is carried out in accordance with the requirements of ISO9001: 2015 and ISO21001: 2018 standards through surveys of a representative sample of students, parents, teachers and administrative staff of the institution. General satisfaction survey results are provided in the SAR and indicate that the majority of stakeholders are satisfied with the University's communication, organisation, and the provided training and general facilities.

With regards to subject-specific improvements or improvements of individual modules, the students as well as alumni and representatives of professional practice consistently report on frequent informal personal exchanges with the department heads. These exchanges may include feedback on the contents of the programmes or individual modules. The students indicate that in some cases, teachers appeared to their courses late or not at all – after they reported this to the department heads, these teachers were replaced. Industry representatives also indicate that some curricular changes were made based on their recommendations, for example with regards to software skills. The industry representatives report being pleased with the graduates of the programmes.

Overall, it is apparent that there are useful formal as well as informal mechanisms in place to gather feedback from the students and other stakeholders. However, it is clear that the formal surveys gather very general data, which limits the administration's abilities to identify improvement opportunities with regards to individual modules. The expert panel positively notes that a few teachers appear to regularly and actively seek student feedback on class contents. However, these informal and inconsistently applied mechanisms may not be sufficient – in some cases, students may hesitate to directly communicate issues to their teachers. The University should therefore implement module-specific anonymous surveys, and ensure that the teaching staff receives these results and discusses them with the surveyed students. In this manner, teaching staff can gather additional feedback from students, and students are shown that their survey responses are valued. As indicated under criterion 2.2, module-specific surveys can also be used to ensure that the estimated workload (particularly self-study hours) are accurate.

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

As previously mentioned, the University plans to introduce module-specific anonymous student surveys, which the peers view positively. The peers furthermore maintain that the

survey results must be discussed between teachers and students to ensure closure of the feedback loop. The University must submit evidence that the surveys as well as the discussion of results have been implemented and take place in a systematic manner.

Criterion not fulfilled.

D Additional Documents

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

For all study programmes

A 1. Plan for laboratory and equipment investments for all programmes

A 2. Sample examination schedules for each programme

For Chemical Engineering:

A 3. Standards for labelling of chemical compounds

A 4. Please describe if and how the preparation of operational guidelines prior to conducting laboratory experiments is taught and required

A 5. Photographs of cupboards used for locking acids, bases, flammable liquids, toxic chemicals and waste produced in experiments

E Comment of the Higher Education Institution (02.08.2021)

The institution provided a detailed statement as well as the following additional documents:

- Information concerning the utilised labelling system for chemical compounds
- Description of how the preparation of operational guidelines prior to conducting laboratory experiments is taught
- Photographs of cupboards used for locking acids, bases, flammable liquids, toxic chemicals and waste produced in experiments
- Sample exam schedules for each study programme
- Revised module handbooks for each study programme
- Sample diploma supplement for each study programme
- Revised rulebook
- Description of the ULT Fablab Project

F Summary: Peer recommendations (19.08.2021)

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma in Chemical Engineering	Suspension	-	EUR-ACE®	-
National Diploma in Mechatronics Engineering	Suspension	-	EUR-ACE®	-
National Diploma in Civil Engineering	With requirements for one year	30.09.2027	EUR-ACE®	30.09.2026

Conditions for resuming the procedure

For the Chemical Engineering and Mechatronics Engineering programme

V1. (ASIIN 1.3) It must be demonstrated on the basis of revised subject content and current master's theses that the intended qualification goals at level 7 of the EQF are achieved and that the students acquire the necessary scientific competences.

Requirements

For all study programmes

A 1. (ASIIN 2.1) Integrate electives in the curricula.

A 2. (ASIIN 2.2) Implement the plans to systematically check that the self-study time is in line with the estimated hours and resolve any discrepancies.

A 3. (ASIIN 2.3) Ensure that the curricula contain sufficient training in academic research and writing.

A 4. (ASIIN 4.3) Expand access to scientific literature databases.

A 5. (ASIIN 5.1) Ensure that the module handbooks are accessible to the relevant stakeholders in the programme language.

A 6. (ASIIN 5.2) Ensure that the diploma supplements or transcripts explain the weighted grading system.

A 7. (ASIIN 5.3) Ensure that the revised rule book is accessible to the relevant stakeholders in the programme language.

A 8. (ASIIN 6) Implement regular surveys at the course level and ensure that teachers discuss the results with students.

For the Chemical Engineering programme

A 9. (ASIIN 1.3, 4.3) Ensure that students are trained to autonomously devise experimental setups for proactively adhering to safety guidelines and environmental standards, in combination with minimizing chemical associated health issues with the aim to independently implement safety assessments in research and development.

For the Mechatronics Engineering programme

A 10. (ASIIN 2.1) Ensure sufficient treatment of the subjects Linear System Theory and Constrained Optimisation.

Recommendations

For all study programmes

E 1. (ASIIN 1.3) It is recommended to implement the plans to integrate ethics as a fixed component in the curricula.

E 2. (ASIIN 2.1) It is recommended to implement the plans to reduce repetition of contents in the curricula.

E 3. (ASIIN 2.3, 3) It is recommended to implement the plans to increase the use of oral exams and seminars.

E 4. (ASIIN 4.1) It is recommended to increase the number of full-time teaching staff.

E 5. (ASIIN 4.3) It is recommended to invest in infrastructure (ex: VPN) which will allow students remote access to campus software.

For the study programmes Mechanical Engineering and Chemical Engineering

E 6. (ASIIN 2.1) It is recommended to implement the plans to integrate more English-language contents in the curricula.

G Comment of the Technical Committees

Technical Committee 01 – Mechanical Engineering/Process Engineering (06.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The technical committee discusses the procedure and agrees with the assessment of the peers.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programme does not comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01 – Mechanical Engineering/Process Engineering.

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

Degree Programme	**ASIIN Seal**	**Maximum duration of accreditation**	**Subject-specific label**	**Maximum duration of accreditation**
National Diploma in Chemical Engineering	Suspension	-	EUR-ACE®	-

Technical Committee 02 – Electrical Engineering/Information Technology (03.0.2021)

Assessment and analysis for the award of the ASIIN seal:

The committee discusses the procedure and agrees for the most part with the assessment of the peers. However, with regards to the condition for the resumption of the procedure (V1), the committee believes that the achievement of EQF level 7 qualifications must be demonstrated not only on the basis of the subject-related contents and Master's theses, but also on the basis of the curriculum. It therefore suggests adding this to the condition V1. In all other respects it agrees with the peers' assessment.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programme does not comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 02 – Electrical Engineering/Information Technology.

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma in Mechatronics Engineering	Suspension	-	EUR-ACE®	-

Conditions for resuming the procedure

For the Chemical Engineering and Mechatronics Engineering programme

V1. (ASIIN 1.3) It must be demonstrated on the basis of revised subject content, curriculum and current master's theses that the intended qualification goals at level 7 of the EQF are achieved and that the students acquire the necessary scientific competences.

Requirements

For all study programmes

A 1. (ASIIN 2.1) Integrate electives in the curricula.

A 2. (ASIIN 2.2) Implement the plans to systematically check that the self-study time is in line with the estimated hours and resolve any discrepancies.

A 3. (ASIIN 2.3) Ensure that the curricula contain sufficient training in academic research and writing.

A 4. (ASIIN 4.3) Expand access to scientific literature databases.

A 5. (ASIIN 5.1) Ensure that the module handbooks are accessible to the relevant stakeholders in the programme language.

A 6. (ASIIN 5.2) Ensure that the diploma supplements or transcripts explain the weighted grading system.

A 7. (ASIIN 5.3) Ensure that the revised rule book is accessible to the relevant stakeholders in the programme language.

A 8. (ASIIN 6) Implement regular surveys at the course level and ensure that teachers discuss the results with students.

For the Chemical Engineering programme

A 9. (ASIIN 1.3, 4.3) Ensure that students are trained to autonomously devise experimental setups for proactively adhering to safety guidelines and environmental standards, in combination with minimizing chemical associated health issues with the aim to independently implement safety assessments in research and development.

For the Mechatronics Engineering programme

A 10. (ASIIN 2.1) Ensure sufficient treatment of the subjects Linear System Theory and Constrained Optimisation.

Recommendations

For all study programmes

E 7. (ASIIN 1.3) It is recommended to implement the plans to integrate ethics as a fixed component in the curricula.

E 8. (ASIIN 2.1) It is recommended to implement the plans to reduce repetition of contents in the curricula.

E 9. (ASIIN 2.3, 3) It is recommended to implement the plans to increase the use of oral exams and seminars.

E 10. (ASIIN 4.1) It is recommended to increase the number of full-time teaching staff.

E 11. (ASIIN 4.3) It is recommended to invest in infrastructure (ex: VPN) which will allow students remote access to campus software.

For the study programmes Mechanical Engineering and Chemical Engineering

E 12. (ASIIN 2.1) It is recommended to implement the plans to integrate more English-language contents in the curricula.

Technical Committee 03 – Civil Engineering, Geodesy and Architecture (06.09.2021)

Assessment and analysis for the award of the ASIIN seal:

The committee discusses the procedure. The committee agrees with the peers' findings that the curriculum is overall solid, but that (as mentioned in A3) additional training in academic research and writing is needed. Overall it reaches the same assessment as the peers, without any deviations.

Assessment and analysis for the award of the EUR-ACE® Label:

The Technical Committee deems that the intended learning outcomes of the degree programme comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 03 – Civil Engineering, Geodesy and Architecture.

The Technical Committee 03 – Civil Engineering, Geodesy and Architecture recommends the award of the seals as follows:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma in Civil Engineering	With requirements for one year	30.09.2027	EUR-ACE®	30.09.2026

Technical Committee 09 – Chemistry, Pharmacy (31.08.2021)

Assessment and analysis for the award of the ASIIN seal:

The peers have doubts about the necessary scientific quality of two study programmes and do not see that they correspond to a Master's level (EQF 7). Therefore, it is proposed to suspend the procedure for the Master's degree programmes Chemical Engineering and Mechatronics Engineering. The Master's programme Civil Engineering, on the other hand, is to be accredited with requirements. The Technical Committee proposes to send the "Guideline for Laboratory Safety Standards" to the university. Overall, the Technical Committee agrees with the peers' assessments.

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

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma in Chemical Engineering	Suspension	-	EUR-ACE®	-

H Decision of the Accreditation Commission (17.09.2021)

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

The accreditation commission discusses the procedure and agrees with the assessment of the peers and the technical committees.

Assessment and analysis for the award of the EUR-ACE® Label:

The Accreditation Commission deems that the intended learning outcomes of the degree programme Civil Engineering complies with the engineering specific parts of Subject-Specific Criteria of the Technical Committees 03. However, the achievement of the learning outcomes at the EQF Level 7 must be demonstrated via fulfilment of the requirements, in particular, those concerning academic research and writing

The Commission deems that the study programmes Chemical Engineering and Mechatronics Engineering do not comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committees 01 and 02, for the reasons outlined in the report.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN Seal	Maximum duration of accreditation	Subject-specific label	Maximum duration of accreditation
National Diploma in Chemical Engineering	Suspension	-	EUR-ACE®	-
National Diploma in Mechatronics Engineering	Suspension	-	EUR-ACE®	-
National Diploma in Civil Engineering	With requirements for one year	30.09.2027	EUR-ACE®	30.09.2026

For the Chemical Engineering and Mechatronics Engineering programme

V1. (ASIIN 1.3) It must be demonstrated on the basis of revised subject content, curriculum and current master's theses that the intended qualification goals at level 7 of the EQF are achieved and that the students acquire the necessary scientific competences.

Requirements

For all study programmes

A 1. (ASIIN 2.1) Integrate electives in the curricula.

A 2. (ASIIN 2.2) Implement the plans to systematically check that the self-study time is in line with the estimated hours and resolve any discrepancies.

A 3. (ASIIN 2.3) Ensure that the curricula contain sufficient training in academic research and writing.

A 4. (ASIIN 4.3) Expand access to scientific literature databases.

A 5. (ASIIN 5.1) Ensure that the module handbooks are accessible to the relevant stakeholders in the programme language.

A 6. (ASIIN 5.2) Ensure that the diploma supplements or transcripts explain the weighted grading system.

A 7. (ASIIN 5.3) Ensure that the revised rule book is accessible to the relevant stakeholders in the programme language.

A 8. (ASIIN 6) Implement regular surveys at the course level and ensure that teachers discuss the results with students.

For the Chemical Engineering programme

A 9. (ASIIN 1.3, 4.3) Ensure that students are trained to autonomously devise experimental setups for proactively adhering to safety guidelines and environmental standards, in combination with minimizing chemical associated health issues with the aim to independently implement safety assessments in research and development.

For the Mechatronics Engineering programme

A 10. (ASIIN 2.1) Ensure sufficient treatment of the subjects Linear System Theory and Constrained Optimisation.

Recommendations

For all study programmes

E 1. (ASIIN 1.3) It is recommended to implement the plans to integrate ethics as a fixed component in the curricula.

E 2. (ASIIN 2.1) It is recommended to implement the plans to reduce repetition of contents in the curricula.

E 3. (ASIIN 2.3, 3) It is recommended to implement the plans to increase the use of oral exams and seminars.

E 4. (ASIIN 4.1) It is recommended to increase the number of full-time teaching staff.

E 5. (ASIIN 4.3) It is recommended to invest in infrastructure (ex: VPN) which will allow students remote access to campus software.

For the study programmes Mechanical Engineering and Chemical Engineering

E 6. (ASIIN 2.1) It is recommended to implement the plans to integrate more English-language contents in the curricula.

I Fulfillment of Requirements (23.09.2022)

Analysis of the peers and the Technical Committees (09.09.2022)

Requirements

For all programmes

A 1. (ASIIN 2.1) Integrate electives in the curricula.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: ULT has added electives to the curriculum.
TC 03	fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 2. (ASIIN 2.2) Implement the plans to systematically check that the self-study time is in line with the estimated hours and resolve any discrepancies.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: ULT now systematically checks that the self-study time is in line with the estimated hours and makes sure that there are no discrepancies.
TC 03	fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 3. (ASIIN 2.3) Ensure that the curricula contain sufficient training in academic research and writing.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: Students are now introduced to research and academic writing.
TC 03	fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 4. (ASIIN 4.3) Expand access to scientific literature databases.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: ULT needs to improve the access to scientific, specialized data bases and online resources for securing high end quality of information offered in the study programme. When accessing the supplied internet address, one only finds the "Duden", travel guides, recent books of general interest, and other compilation of books and patents, which are available from open sources.
TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 5. (ASIIN 5.1) Ensure that the module handbooks are accessible to the relevant stakeholders in the programme language.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: The module handbook needs to be accessible for all stakeholders not only for those with access to the ERP system.

TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 6. (ASIIN 5.2) Ensure that the diploma supplements or transcripts explain the weighted grading system.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: The Diploma Supplement does not explain the weighted grading system. An updated Transcript of Records was not provided.
TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 7. (ASIIN 5.3) Ensure that the revised rule book is accessible to the relevant stakeholders in the programme language.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The revised version of the University Rulebook is now published in the ULT website.
TC 03	fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

A 8. (ASIIN 6) Implement regular surveys at the course level and ensure that teachers discuss the results with students.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: ULT has not verified how students receive feedback on the results of the surveys and how this feedback is used for further improving the particular course.
TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.

Decision of the Accreditation Commission (23.09.2022)

Degree Programme	**ASIIN-seal**	**Subject-specific label**	**Maximum duration of accreditation**
National Diploma in Civil Engineering	Requirements A4, A5, A6, and A8 not fulfilled	EUR-ACE®	prolongation for six months

J Fulfillment of Requirements (24.03.2023)

Analysis of the peers and the Technical Committee (15.03.2023)

Requirements

For all programmes

A 4. (ASIIN 4.3) Expand access to scientific literature databases.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: ULT needs to improve the access to scientific, specialized data bases and online resources for securing high end quality of information offered in the study programme. When accessing the supplied internet address, one only finds the "Duden", travel guides, recent books of general interest, and other compilation of books and patents, which are available from open sources.
TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.
Second Treatment	
Peers	not fulfilled Vote: per majority Justification: From comparing the information submitted in 2022 and checking the provided internet address, in order to search for and in scientific databases, the peers could not find evidence that measures have been undertaken by ULT to address A4 for fulfilling the requirement. The peers could not enter the scholarvox system..
TC 03	Fulfilled Vote: unanimous Justification: From checking the provided internet address, in order to search for and in scientific databases, the TC confirms that

	measures have been undertaken by ULT to address A4 for fulfilling the requirement. The TC could enter the scholarvox system.

A 5. (ASIIN 5.1) Ensure that the module handbooks are accessible to the relevant stakeholders in the programme language.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: The module handbook needs to be accessible for all stakeholders not only for those with access to the ERP system.
TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.
Second Treatment	
Peers	Fulfilled Vote: unanimous Justification: The module handbook for the Civil Engineering programme is now available to stakeholders in English via the internet. A more user friendly version having electives/curricular options directly linked to semesters, where the modules offered appear for the first time, and an English version of the page displaying the curricular overview, probably will be very much welcomed by users.
TC 03	Fulfilled Vote: unanimous Justification: The module handbook for the Civil Engineering programme is now available to stakeholders in English via the internet.

A 6. (ASIIN 5.2) Ensure that the diploma supplements or transcripts explain the weighted grading system.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: The Diploma Supplement does not explain the weighted grading system. An updated Transcript of Records was not provided.

TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.
Second Treatment	
Peers	Partly Fulfilled Vote: per majority Justification: A diploma supplement now is available, however, a transcript of records still misses. ULT should add a transcript of records including a weighting scheme displaying which courses in what statistical weight have been used for calculating a final mark.
TC 03	Fulfilled Vote: unanimous Justification: The TC considers the Diploma Supplement to be complete and in accordance with international standards. Therefore, the TC suggests to recommend to include a weighting scheme displaying which courses in what statistical weight have been used for calculating a final mark.

A 8. (ASIIN 6) Implement regular surveys at the course level and ensure that teachers discuss the results with students.

Initial Treatment	
Peers	not fulfilled Vote: unanimous Justification: ULT has not verified how students receive feedback on the results of the surveys and how this feedback is used for further improving the particular course.
TC 03	not fulfilled Vote: unanimous Justification: The TC agrees with the comments and opinion of the experts.
AC	not fulfilled Vote: unanimous Justification: The AC agrees with the comments and opinion of the experts and the TC.
Second Treatment	
Peers	Partly Fulfilled Vote: per majority

	Justification: A survey system has been established, teachers draw conclusions. However, the peers could not deduce from the information supplied, whether or not the results are discussed with students for developing ideas how to address justified concerns raised by the students.
TC 03	Fulfilled Vote: unanimous Justification: The TC confirms that a survey system has been implemented and that lecturers use those results in order to further develop the programme. Therefore, the TC suggests to recommend to discuss the results with students on a regular basis.

Decision of the Accreditation Commission (24.03.2023)

Degree Programme	ASIIN seal	Subject-specific labels	Maximum duration of accreditation
National Diploma in Civil Engineering	All requirements fulfilled*	EUR-ACE®	30.09.2026

K Resumption of the procedure (24.03.2023)

Statement of the university (24.01.2023)

ULT submits extensive documentation to prove that the prerequisite for resuming the procedure has been met.

Analysis of the peers and the Technical Committees (15.03.2023)

Prerequisite for the resumption of the procedure

V 1. (ASIIN 1.3) It must be demonstrated on the basis of revised subject content, curriculum and current master's theses that the intended qualification goals at level 7 of the EQF are achieved and that the students acquire the necessary scientific competences.

Peers	Not fulfilled Vote: per majority Justification: The curriculum of the chemical engineering programme has been gradually revised in order to meet further criticism raised by the peers, but is in its heart still an applied chemistry curriculum. Objectives of the chemistry modules, to sum up, still do not consistently meet demands for reaching the EQF 7 level, but rather adhere at the EQF 6 level, corresponding in terms of depth in most instances topics taught in Chemistry Bachelor's programmes. Master theses provided by ULT in 2023 closely adhere in terms of scientific depths and quality to theses provided by the university for the same purpose in 2021, which were classified at that time as valid for documenting EQF 6 level of the study Chemical Engineering programme. The five submitted master theses from the Mechatronics programme clearly focus on practical topics being typical for universities of applied sciences. Scientific standards are not met, neither with respect to content nor to formal and structural issues. In some of the theses, sufficient scientific qualifications of the supervisors have not been evidenced or seem questionable.

TC 01	Not fulfilled Vote: unanimous Justification: The committee agrees with the experts that it is still not possible to confirm the achievement of a EQF level 7 qualification of the graduates.
TC 02	Not fulfilled Vote: unanimous Justification: The TC agrees with the experts that the university was not able to verify that the programmes achieve a EQF level 7 qualification of the graduates.
TC 09	Not fulfilled Vote: unanimous Justification: The TC notes that the documents submitted by the university - especially the final theses - do not prove that the level of a Master's programme (EQF 7) is consistently achieved. For this reason, he is in favour of rejecting the accreditation.

Decision of the Accreditation Commission (24.03.2023)

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
National Diploma in Chemical Engineering	Prerequisite V1 not fulfilled	EUR-ACE® denied	Rejection
National Diploma in Mechatronics Engineering	Prerequisite V1 not fulfilled	EUR-ACE® denied	Rejection

Appendix: Programme Learning Outcomes and Curricula

According to the module handbook, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the **Chemical Engineering** degree programme:

Table 1 Knowledge

K1	Knowledge 1	Relevant and deep Knowledge of mathematics, statistics, chemical engineering, chemistry, and physics for understanding, describing and solving typical chemical problems
K2	Knowledge 2	Knowledge of the fundamental principles of chemical engineering for the modelling and the simulation of chemical reactions, biomolecular processes, mass and transport processes, energy and separation processes.
K3	Knowledge 3	Understand the principles of chemical analysis methods, limitations and applicability to chemical processes.
K4	Knowledge 4	Have Knowledge and criteria about organic chemistry and synthesis, inorganic chemistry, physical chemistry and materials science
K5	Knowledge 5	Knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformation that they undergo. This includes uses of chemicals and their interactions, danger & warning signs, production techniques and disposal methods.
K6	Knowledge 6	Ability to develop a basic design for a given products and processes according to a specifications, that means the design of methods and the ability to apply them.
K7	Knowledge 7	Knowledge of raw materials production processes, quality control, costs and other techniques for maximizing the effective manufacture and distribution of goods.
K8	Knowledge 8	Understand the main concepts of process control and process security in chemical engineering
K9	Knowledge 9	The application of statistical methods that makes use of representative sampling to ensure that a product meet specifications, sample size, confidence interval, standard deviation acceptance criteria, etc.

Table 2 Skills

S1	Skill 1	The ability to adjust communication style to more effectively communicate in a different personal, cultural or societal environment
S2	Skill 2	Experimental practices and procedures to develop data useful in addressing design or operation problems encountered in real life
S3	Skill 3	Leadership and negotiation abilities, capability of using relevant activating resources to direct and lead working groups, motivate collaborator, generate empathy and negotiate.
S4	Skill 4	Fluency in English which can improve communication and networking with others.
S5	Skill 5	Able to assimilate, organize and present or communicate information in a fashion that is both understandable and designed to engage the recipients in the process.
S6	Skill 6	Ability to use different applications of spreadsheet programs in an effective and efficient manner for a variety of chemical engineering purposes.
S7	Skill 7	Familiarity with required computer, software applications in the area of chemical engineering
S8	Skill 8	Ability to work effectively in groups that have diverse skills, abilities, personalities, cultures to solve specific problems. Ability to put aside personal or individual concerns to achieve the optimal solution
S9	Skill 9	Project Management, planning, organizing, and controlling available resources to achieve a specific goal. Design or retrofit of a unit operation or large multi-step process.

Table 3 Competences

C1	Competence 1	Determining causes of operating errors and deciding how to manage.
C2	Competence 2	Design chemical engineering processes, equipment and installations
C3	Competence 3	The ability to analyse complex problems in the field of chemical engineering
C4	Competence 4	Evaluate in structured way the hazards for safety, health and hygiene in a process that either exist in the design stage and apply relevant measures.
C5	Competence 5	Plan, carry out, explain and interpret experiments in different area of chemical engineering
C6	Competence 6	The ability to design, implement, test and validate solutions : Innovate and design creatively
C7	Competence 7	Be able of understanding the impact of engineering solutions on the environment and the social context.
C8	Competence 8	The ability to carry out fundamental research activities or the ability to collect relevant information, evaluate it and exploit it.
C9	Competence 9	Standards and International regulation : compliance with codes and regulations with respect to aspects: sizing, procedures and execution

The following **curriculum** is presented:

CHEMICAL ENGINEERING Year 1 Semester 1									
Code	**UNIT**	**Modules**	**Semester Credit Hours**			**PW**		**ECTS CREDITS**	
			IC	**PW**	**SSH**	**Module**	**Unit**	**Module**	**Unit**
U1.1	**Fundamental Sciences**	Inorganic Chemistry	21	0	21	2	7	2	7
		Thermodynamics	42	3	35	2.5		2.5	
		Experimental Chemistry	42	6	35	2.5		2.5	
U1.2	**Process & Control**	Heat Transfer	42	0	35	4	6	4	6
		Measurement & Instrument	21	0	21	2		2	
U1.3	**Engineering Tools**	Applied Computing : Excel Programming	0	21	21	1.5	6	1.5	6
		Applied Statistics	21	0	21	1.5		1.5	
		Applied Mathematics	42	0	35	3		3	
U1.4	**Organic Synthesis: Structure & Analysis**	Organic Chemistry	42	3	35	3.5	7	3.5	7
		Polymers Synthesis 1	42	3	35	3.5		3.5	
U1.5	**Languages & Communication**	English I	21	0	21	2	4	2	4
		Communication Techniques	21	0	21	2		2	
		TOTAL	**357**	**36**	**336**	**30**	**30**	**30**	**30**
		Total Semester Workload	**729 H**						

CHEMICAL ENGINEERING Year 1 Semester 2									
Code	**UNIT**	**Modules**	**Semester Credit Hours**			**COEF**		**ECTS CREDITS**	
			IC	**PW**	**SSH**	**Module**	**Unit**	**Module**	**Unit**
U2.1	**Fundamental Sciences**	Structural Biochemistry	21	0	21	2.5	6	2.5	6
		Kinetics Reaction	42	3	35	3.5		3.5	
U2.2	**Process & Control**	Applied Thermodynamics	21	9	21	2	7	2	7
		Matter Transfer	42	0	35	2.5		2.5	
		Fluid Mechanics	42	9	35	2.5		2.5	
U2.3	**Engineering Tools**	Numerical Modeling : VB Excel II	0	21	21	2	4	2	4
		Control & Regulation	21	0	21	2		2	
U2.4	**Organic Synthesis: Structure & Analysis**	Organic Chemistry II	42	6	35	2	7	2	7
		Polymers Synthesis II	21	3	21	1.5		1.5	
		Spectroscopic techniques of analysis	42	3	35	2		2	
		Workshop : Synthesis I & Analysis	21	0	21	1.5		1.5	
U2.5	**Languages & Communication**	English II	21	0	21	2	4	2	4
		Personnel Professional Project (PPP)	21	0	21	2		2	
U2.6	**PROJECTS**	Mini project	0	21	21	2	2	2	2
		TOTAL	**357**	**75**	**364**	**30**	**30**	**30**	**30**
		Total Semester Workload	**796**						

0 Appendix: Programme Learning Outcomes and Curricula

CHEMICAL ENGINEERING Year 2 Semester 1									
Code	UNIT	Modules	Semester Credit Hours			COEF		CREDITS	
			IC	PW	SSH	Module	Unit	Module	Unit
U3.1	Energy Transfer	Matter& Energy Balance	42	0	35	3	5	3	5
		Heat Exchanger & Pumps	21	0	21	2		2	
U3.2	Process & Control	Unit Operation I : Mechanics	42	9	35	3.5	7	3.5	7
		Chemical Reactors	42	3	35	3.5		3.5	
U3.3	Engineering Tools	Separation & Validation Method	42	6	35	3	6	3	6
		Methodology of Experimental design (NEMROD-W)	21	0	21	1.5		1.5	
		Simulation : Aspen I	0	21	21	1.5		1.5	
U3.4	Material & Organic Synthesis	Analytical Electrochemistry	42	3	35	3	7	3	7
		Solid Chemistry	21	0	21	2		2	
		Organometallic Chemistry	21	6	21	2		2	
U3.5	Languages & Management	English (TOEIC) I	42	0	35	2	5	2	5
		Marketing	21	0	21	1.5		1.5	
		Project Management	21	0	21	1.5		1.5	
	TOTAL		378	48	357	30	30	30	30
	Total Semester Workload		783						

CHEMICAL ENGINEERING Year 2 Semester 2									
Code	UNIT	Modules	Semester Credit Hours			COEF		ECTS CREDITS	
			IC	PW	SSH	Module	Unit	Module	Unit
U4.1	Process & Control	Unit Operation II : Physical I (Distillation-absorption-Extraction)	42	9	35	3.5	7	3.5	7
		Unit Operation III : Physical II (Adsorption-Drying-crystallization)	42	6	35	3.5		3.5	
U4.2	Industrial Manufacturing	Furnaces & Boilers	42	0	35	3	5	3	5
		Simulation : HYSIS	0	21	21	2		2	
U4.3	Inorganic Material & Characterization	Molecular Technique &Characterization	21	0	21	2	5	2	5
		Physical Chemistry of Polymers	42	6	35	3		3	
U4.4	Organic Synthesis: Structure & Analysis	Fine Chemistry	21	6	21	2	6	2	6
		Industrial Electrochemistry	42	3	35	2		2	
		Workshop : Synthesis II	0	21	21	2		2	
U4.5	Languages & Corporate Culture 1	English (TOEIC) II	42	0	35	2	5	2	5
		Business Management	21	0	21	1.5		1.5	
		Industrial Production Management	21	0	21	1.5		1.5	
U4.6	PROJECTS	Annual Project	0	21	21	2	2	2	2
	TOTAL		336	93	357	30	30	30	30
	Total Semester Workload		786						

CHEMICAL ENGINEERING Year 3 Semester 1									
Code	UNIT	Modules	Semester Credit Hours			COEF		CREDITS	
			IC	PW	SSH	Module	Unit	Module	Unit
U5.1	Process & Control	Risk Analysis & Process Security	42	0	35	3.5	5	3.5	5
		Environment &Renewable Energy	21	0	21	1.5		1.5	
U5.2	Process & Treatments	Treatment of Gaseous effluents & Solid Waste	21	0	21	1.5	7	1.5	7
		Water Treatment	42	15	35	3		3	
		High Pressure Extraction Techniques	21	0	21	2.5		2.5	
U5.3	Industrial Manufacturing	Simulation : Aspen II	0	21	21	2.5	6	2.5	6
		Processing of Polymers & Composites	42	3	35	3.5		3.5	
U5.4	Synthesis & Materials	Materials Science	42	0	35	3.5	7	3.5	7
		Formulation	42	9	35	3.5		3.5	
U5.5	Languages & Corporate Culture 2	Quality Control & Regulation	21	0	21	1.5	5	1.5	5
		Start Up	21	0	21	1.5		1.5	
		Lean Management	42	0	35	2		2	
		TOTAL	357	48	336	30	30	30	30
		Total Semester Workload	741						

CHEMICAL ENGINEERING Year 3 Semester 2						
Code	UNIT	Credit Hours	IC	Project	COEF	ECTS Credit
U6.1	Graduation Research Project (4-6 months)	450	-	450		30
U6.2	Internship 1 (1-2 months)	-	-			-
U6.3	Internship 2 (1-2 months)	-	-			-
	TOTAL	450	0	450		30

According to the module handbook, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the **Mechatronics Engineering** degree programme:

Table 1 Knowledge

K1	Knowledge 1	Academic Knowledge of electronics, electrical engineering, automation, mechanics and embedded systems
K2	Knowledge 2	Knowledge of embedded systems programming, simulation, and verification
K3	Knowledge 3	Mastery of engineering methods and tools for Identification, modelling and resolution of complex problems
K4	Knowledge 4	Knowledge of new innovative on-board solutions using Artificial Intelligence AI
K5	Knowledge 5	Knowledge of mechanical and electrical design and modelling software (Catia, LabView, Matlab, Eagle ...)

Table 2 Skills

S1	Skill 1	Ability to integrate into an organization, to lead and develop it with the spirit of leadership and management ability.
S2	Skill 2	Ability to undertake, innovate, develop new idea of projects, and resolve emergency situations
S3	Skill 3	Fluency in English and other foreign languages which can improve communication and networking with others, and facilitate integration within international setting.
S4	Skill 4	Ability to analyse the country's economic, social, political and cultural issues
S5	Skill 5	Autonomy, Tasks planning, Decision-making skills

Table 3 Competencies

C1	Competence 1	Study of complex mechatronics systems
C2	Competence 2	Study, Design, and Implementation of mechatronics systems
C3	Competence 3	Hands on experience on Programming of on-board cards
C4	Competence 4	Complete realization of Mechatronics systems
C5	Competence 5	Project management skills
C6	Competence 6	Improvement of production chains
C7	Competence 7	Creation of connected and intelligent products using (IOT)

The following **curriculum** is presented:

Mechatronics Engineering – Year 1 Semester 1										
Code	UNIT	Modules	Semester Credit Hours				COEFFICIENT		ECTS Credits	
			IC	PW	Project	SSH	Module	UNIT	Module	UNIT
U1.1	*Mathematics 1*	Math for Engineering	42	0	0	35	2	3,5	3	5
		Statistics & Probability	21	0	0	21	1,5		2	
U1.2	*Electronics Electrotechnics & Automatic control EEA 1*	Regulation & Servo Control	42	10.5	0	35	2	8	2	8
		Analog Electronics 1	21	10.5	0	21	2		2	
		Robotics 1	21	21	0	35	2		2	
		Digital Electronics	10.5	10.5	0	21	2		2	
U1.3	*Mechanics & Mechatronics Elements*	Workshop Mechatronics Systems Design 1 (CATIA V5)	0	21	0	21	2	6,5	1	6
		Theory of Materials	21	0	0	21	1,5		2	
		Mechanical Engineering	21	0	0	21	2		2	
		Introduction to Mechatronics Systems	0	0	21	21	1		1	
U1.4	*Computer Science 1*	Computer Architecture & Assembly Programming	10.5	10.5	0	21	2	4	2	4
		C Programming	21	21	0	35	2		2	
U1.5	*Languages & Social Science*	English 1	21	0	0	21	1	2	2	4
		Communication Techniques	21	0	0	21	1		2	
U1.6	*Project 1*	Supervised Project 1	0	0	21	21	3	3	3	3
		TOTAL	273	105	42	371	27	27	30	30
		Total Semester Workload	791 H							

Mechatronics Engineering – Year 1 Semester 2										
Code	UNIT	Modules	Semester Credit Hours				COEFFICIENT		ECTS Credits	
			IC	PW	Project	SSH	Module	UNIT	Module	UNIT
U2.1	*Mathematics 2*	Operational Research	21	0	0	21	1,5	3	1,5	3
		Numerical Analysis	21	0	0	21	1,5		1,5	
U2.2	*Mechanics & Mechatronics Elements 2*	Workshop Mechatronics systems Design 2 (CATIA V5)	0	21	0	21	1,5	8	1,5	7,5
		Resistance Of Materials ROM	10.5	10.5	0	21	2,5		2	
		Mechanical Engineering	21	0	0	21	1		1,5	
		Manufacturing Technology	10.5	10.5	0	21	1,5		1,5	
		Transmission Mechanics	21	0	0	21	1,5		1	
U2.3	*Electronics Electrotechnics & Automatic control EEA2*	Electrotechnics	21	0	0	21	1,5	7.5	2	8
		Electronic Functions	42	21	0	35	2		2	
		Robotics 2	21	0	0	21	2		2	
		Industrial Programmable Automated 1	21	0	0	21	2		2	
U2.4	*Computer Science 2*	Java Object Oriented Programming	21	21	0	35	2,5	6.5	2	5,5
		Workshop Operating Systems OS (UNIX & LINUX)	21	0	0	21	2		1,5	
		Mechatronics Systems Simulation- Lab view	10.5	10.5		21	2		2	
U2.5	*Languages & Social Science*	English 2	21	0	0	21	1	2	1,5	3
		Personnel & Social Development	21	0	0	21	1		1,5	
U2.6	*Project 2*	Supervised Project 2	0	0	21	21	3	3	3	3
		TOTAL	304.5	94.5	21	385	30	30	30	30
		Total Semester Workload	*805H*							

0 Appendix: Programme Learning Outcomes and Curricula

Mechatronics Engineering – Year 2 Semester 1										
Code	UNIT	Modules	Semester Credit Hours				COEFFICIENT		ECTS Credits	
			IC	PW	Project	SSH	Module	UNIT	Module	UNIT
U3.1	*Electronics Electrotechnics & Automatic control EEA3*	Digital Control	21	0	0	21	2	10	2	10
		Power Electronics	21	21	0	35	2		2	
		Sensors & Actuators	42	0	0	35	2		2	
		Instrument & Measurement	0	0	21	21	2		2	
		Signal Processing	21	0	0	21	2		2	
U3.2	*Mechanics & Mechatronics Elements 3*	Workshop Computer Aided Design CAD (CATIA V5)	0	21	0	21	2	8	2	8
		Manufacturing Analysis	21	0	0	21	2		2	
		Robotics 3	21	21	0	35	2		2	
		Continuum Mechanics	21	0	0	21	2		2	
U3.3	*Embedded Systems*	Embedded Systems based on 32bits Microcontrollers	21	21	0	35	2	6	2	6
		Python Programming	10.5	10.5	0	21	2		2	
		Microcontroller & Microprocessor	10.5	10.5	0	21	2		2	
U3.4	*Languages & Social Science*	Innovation Management	21	0	0	21	1	3	1	3
		ENGLISH TOEIC 1	21	0	0	21	1		1	
		Intellectual Propriety IP Law	21	0	0	21	1		1	
U3.5	*Year Project 1*	Year Project1	0	0	21	21	3	3	3	3
		TOTAL	273	105	42	392	30	30	30	30
		Total Semester Workload	812H							

Mechatronics Engineering – Year 2 Semester 2										
Code	UNIT	Modules	Semester Credit Hours				COEFFICIENT		ECTS Credits	
			IC	PW	Project	SSH	Module	UNIT	Module	UNIT
U4.1	*Modelling*	Lean Manufacturing	21	0	0	21	2	4,5	1.5	4
		CAM Computer Aided Manufacturing using CNC	0	42	0	35	2,5		2.5	
U4.2	*Mechanics & Mechatronics Elements 4*	Mechatronics Systems Dynamic	0	21	0	21	2	8,5	1.5	7,5
		Pneumatic & Hydraulic	21	0	0	21	2		1.5	
		Fluid Mechanics & Applied Thermodynamics	21	21	0	35	2,5		2,5	
		Mechanical Vibrations	21	0	0	21	2		2	
U4.3	*Electronics Electrotechnics & Automatic control EEA 4*	Vision & Image Processing	21	0	0	21	2	9,5	2	9,5
		Industrial programmable Automated 2	21	21	0	35	2,5		2,5	
		Electrical Machine	21	21	0	21	2,5		2,5	
		Robotics 4	21	21	0	35	2,5		2,5	
U4.4	*Computer Science 3*	Real Time Programming	21	21	0	35	2,5	2,5	3	3
U4.5	*Languages & Social Science*	English TOEIC 2	21	0	0	21	1	2	1.5	3
		Marketing	21	0	0	21	1		1.5	
U4.6	*Year Project 2*	Year Project 2	0	0	21	21	3	3	3	3
		TOTAL	231	168	21	364	30	30	30	30
		Total Semester Workload	784H							

Mechatronics Engineering – Year 3 Semester 1										
Code	UNIT	Modules	Semester Credit Hours				COEFFICIENT		ECTS Credits	
			IC	PW	Project	SSH	Module	UNIT	Module	UNIT
U5.1	Modelling & Optimization	Electrical Installation : REVIT	0	21	0	21	2	4	2	4
		Energy Management	21	0	0	21	2		2	
U5.2	*Mechanics & Mechatronics Elements* 5	Machines Dynamics	21	0	0	21	2	6	2	6
		CMMS Computerized Maintenance Management System	0	21	0	21	2		2	
		Finite Element & Abaqus Method	21	21	0	35	2		2	
U5.3	*Electronics Electrotechnics & Automatic control* EEA 5	Analysis & Control of Complex Systems	21	0	0	21	2	6	2	6
		Design & Implementation of Automated Systems	10.5	10.5	0	21	2		2	
		Robotics Control	21	0	0	21	2		2	
U5.4	Computer Science 4	Synthesis & Technologies of Integrated Circuits	21	21	0	35	2	8	2	8
		Local Industrial Network LIN	21	0	0	21	1		1	
		Artificial Intelligence (AI)	21	0	0	21	1		1	
		Internet Of Things (IOT)	21	21	0	35	3		3	
		Embedded Linux	14	7	0	21	1		1	
U5.5	Mechatronic Elements Reliability Methods	Reliability & Safety of Mechatronic systems	21	0	0	21	2	4	2	4
		Business Intelligence	21	0	0	21	2		2	
U5.6	*Social Science*	Lean start-up	21	0	0	21	1	2	1	2
		Industry 4.0	21	0	0	21	1		1	
		TOTAL	297.5	122.5	0	399	30	30	30	30
		Total Semester Workload	819H							

MECHATRONICS ENGINEERING Year 3 Semester 2						
Code	UNIT	Credit Hours	IC	Project	COEF	ECTS Credit
U6.1	Graduation Research Project (4-6 months)	750	-	750		30
U6.2	Internship 1 (1-2 months)	-	-			-
U6.3	Internship 2 (1-2 months)	-	-			-
	TOTAL	750	0	750		30

According to the module handbook, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the **Civil Engineering** degree programme:

Table 1 Knowledge

K1	Knowledge 1	Knowledge and understanding of specialization subjects in civil engineering and the capacity for analysis and synthesis
K2	Knowledge 2	Knowledge of hydrogeological surveys and analysis of a construction site
K3	Knowledge 3	Knowledge of structures, deformation phenomena, and resistance of materials
K4	Knowledge 4	Knowledge of construction materials, reinforced concrete techniques and different applications
K5	Knowledge 5	Knowledge of soil mechanics, geological and geophysical aspects
K6	Knowledge 6	Knowledge of technical drawing, design, structural calculation, and building simulation software

Table 2 Skills

S1	Skill 1	Ability to integrate into an organization, to lead and develop it with the spirit of leadership and management ability.
S2	Skill 2	Ability to undertake, innovate, develop new idea of projects, and resolve emergency situations
S3	Skill 3	Fluency in English and other foreign languages which can improve communication and networking with others, and facilitate integration within international setting.
S4	Skill 4	Ability to analyse the country's economic, social, political and cultural issues
S5	Skill 5	Autonomy, Tasks planning, Decision-making skills
56	Skill 6	Mastery of engineering methods and tools: Identification, modeling and resolution of complex problems

Table 3 Competencies

C1	Competence 1	Development of a detailed preliminary design of a construction
C2	Competence 2	Design, sizing of Building construction, infrastructure and engineering structures projects
C3	Competence 3	Management, planning, and organization of construction sites
C4	Competence 4	Follow up and control of construction and execution of a civil engineering work
C5	Competence 5	Standards: compliance with codes and regulations with respect to aspects: sizing, procedures and execution
C6	Competence 6	Hands on experience computer tools for design, simulation and data acquisition

The following **curriculum** is presented:

CIVIL ENGINEERING Year 1 Semester 1									
Code	UNIT	Modules	Semester Credit Hours			COEFFICIENT		ECTS Credits	
			IC	PW	SSH	Module	Unit	Module	Unit
U1.1	*Mathematics 1*	Engineering Mathematics	42	0	35	3	5	3	5
		Probability & Statistics	21	0	21	2		2	
U1.2	*Materials science*	Materials Science	21	0	21	2	6,5	2	6,5
		Measurement & Instruments	21	0	21	2		2	
		Thermal effect	42	0	35	2,5		2,5	
U1.3	*Mechanics 1*	Solid Mechanics	21	0	21	2	6,5	2	6,5
		Construction General Process	42	0	35	2,5		2,5	
		Fluid Mechanics	42	0	35	2		2	
U1.4	*Computer & Technologies*	Algorithm & C Programming	42	0	35	3	5	3	5
		Computer Aided Drawing CAD 1	0	42	21	2		2	
U1.5	*Languages & Soft Skills*	English I	21	0	21	1,5	5	1,5	5
		Project Management	21	0	21	2		2	
		Personnel Development	21	0	21	1,5		1,5	
U1.6	*Projects*	Mini Project	0	21	21	2	2	2	2
		SUB TOTAL	357	63	364	30	30	30	30
		Total Semester Workload	784						

CIVIL ENGINEERING Year 1 Semester 2									
Code	UNIT	Modules	Semester Credit Hours			COEFFICIENT		ECTS Credits	
			IC	PW	SSH	Module	Unit	Module	Unit
U2.1	*Mathematics 2*	Numerical Analysis	0	21	21	2	4	2	4
		Operational Research	21	0	21	2		2	
U2.2	*Mechanics 2*	Continuum Mechanics	21	0	21	2	5	2	5
		Resistance Of Material ROM	42	0	35	3		3	
U2.3	*Languages & Soft Skills*	Communication Techniques	21	0	21	1,5	3	1,5	3
		English II	21	0	21	1,5		1,5	
U2.4	*Technical Science*	Hydraulic & Hydrology	42	0	35	2,5	5	2,5	5
		Topography	30	12	35	2,5		2,5	
U2.5	*Project*	Mini Project	0	21	21	2	2	2	2
U2.6	*Computer & Material Sciences*	Computer Aided Drawing CAD 2	0	42	35	2	7	2	7
		Concrete & Material Technology	21	21	35	3		3	
		Geology et Geophysics	42	0	35	2		2	
U2.7	*Procurement & BIM*	Public Procurement Process	21	0	21	2	4	2	4
		Building Information Modeling BIM 1	0	21	21	2		2	
		TOTAL	282	138	357	30	30	30	30
		Total Semester Workload	777H						

CIVIL ENGINEERING Year 2 Semester 1									
Code	UNIT	Modules	Semester Credit Hours			COEFFICIENT		ECTS Credits	
			IC	PW	SSH	Module	Unit	Module	Unit
U3.1	*Mechanics 3*	Soil Mechanics 1	42	0	35	3	8	3	8
		Diagnosis & Rehabilitation of Buildings	21	0	21	2		2	
		Theory of Structure 1	42	21	35	3		3	
U3.2	*Building Technique*	Urbanism	21	0	21	1,5	5,5	1,5	5,5
		Building Information Modeling BIM 2	0	21	21	2		2	
		Building Physics	21	0	21	2		2	
U3.3	*Public Works 1*	Economic Evaluation of Constructions	21	0	21	2	7	2	7
		Worksite Organization	21	0	21	2		2	
		Road Engineering 1	42	0	35	3		3	
U3.4	*Languages & Soft Skills*	English TOEIC 1	21	0	21	1,5	3	1,5	3
		Corporate Management	21	0	21	1,5		1,5	
U3.5	*Project Management*	Reinforced Concrete 1	42	0	35	3	4,5	3	4,5
		Building Simulation (Arche)	0	42	35	1,5		1,5	
U3.6	*Project*	Annual Project 1	0	21	21	2	2	2	2
		TOTAL	315	105	364	30	30	30	30
		Total Semester Workload	784H						

CIVIL ENGINEERING Year 2 Semester 2									
Code	UNIT	Modules	Semester Credit Hours			COEFFICIENT		ECTS Credits	
			IC	PW	SSH	Module	Unit	Module	Unit
U4.1	*Mechanics 4*	Soil Mechanics 2	42	21	35	3	8	3	8
		Building Information Modeling BIM 3	0	21	21	2		2	
		Theory of Structures 2	42	0	35	3		3	
U4.2	*Building Technique*	Reinforced Concrete 2	42	0	35	3	8	3	8
		Building Projects and Metallic Construction MC (Robot Software)	0	21	35	2		2	
		Metallic Construction CM 1	42	0	35	3		3	
U4.3	*Public Works 2*	Road Engineering 2	42	0	35	3	8	3	8
		Urban Hydraulics	42	0	35	3		3	
		Road Project Design	0	42	35	2		2	
U4.4	*Project*	Annual Project 2	0	21	21	2	2	2	2
U4.5	*Languages & Soft Skills*	English TOEIC 2	21	0	21	2	4	2	4
		Business Start Up	21	0	21	2		2	
TOTAL			294	126	364	30	30	30	30
Total Semester Workload			784H						

CIVIL ENGINEERING Year 3 Semester 1									
Code	UNIT	Modules	Semester Credit Hours			COEFFICIENT		ECTS Credits	
			IC	PW	SSH	Module	Unit	Module	Unit
U5.1	*Mechanics*	Earthwork	21	21	35	3	9	3	9
		Structure Dynamics	42	0	35	3		3	
		Finite Element Method FEM	21	21	35	3		3	
U5.2	*Sciences & Technology*	Prestressed Concrete	42	0	35	3	8	3	8
		Case Study (CAD)	21	21	35	2		2	
		Metallic Construction 2	42	0	35	3		3	
U5.3	*Public Works 3*	Roads & Various Networks RVN	21	0	21	2	6	2	6
		Bridges Engineering	42	21	35	4		4	
U5.4	*BIM & Applications*	Building Information Modeling BIM 4	0	42	35	3	7	3	7
		Lean Start-Up	21	0	21	2		2	
		Land Law	21	0	21	2		2	
TOTAL			294	126	343	30	30	30	30
Total Semester Workload			763H						

CIVIL ENGINEERING Year 3 Semester 2						
Code	UNIT	Credit Hours	IC	Project	COEF	ECTS Credit
U6.1	Graduation Research Project (4-6 months)	450	-	450		30
U6.2	Internship 1 (1-2 months)	-	-			-
U6.3	Internship 2 (1-2 months)	-	-			-
	TOTAL	450	0	450		30