# ASIIN Seal & EUR-ACE® Label

# Accreditation Report

## Master's Degree Programmes
***Environmental Engineering and Sustainable Energy***
***Chemical Engineering***

Provided by
**School of Chemical Engineering, University Rovira i Virgili, Tarragona**

Version: 18 March 2022

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# A About the Accreditation Process

| Name of the degree programme (in original language) | (Official) English translation of the name | Labels applied for [1] | Previous accreditation (issuing agency, validity) | Involved Technical Committees (TC)[2] |
|---|---|---|---|---|
| Màster Universitari en Enginyeria Ambiental i Sostenibilitat Energètica | University Master's Degree in Environmental Engineering and Sustainable Energy | ASIIN, EUR-ACE® | | 01, 05 |
| Màster Universitari en Enginyeria Química | University Master's Degree in Chemical Engineering | ASIIN, EUR-ACE® | AQU –until 04/10/2020<br>EUR-ACE® Label (ANECA) until 27/09/2021 | 01, 09 |
| **Date of the contract:** 04.03.2020<br>**Submission of the final version of the self-assessment report:** 26.08.2020<br>**Date of the audit:** 25.10. – 26.10.2020<br>**Online Audit** | | | | |
| Peer panel:<br>Prof. Dr. Juergen Grotemeyer, Christian-Albrechts-University Kiel<br>Prof. Dr.-Ing. Kathrin Lehmann, Brandenburg University of Technology<br>Prof. Dr. Antonio López Cabanes, University of Murcia<br>Prof. Dr. Francisco Javier Pérez Trujillo, Complutense University of Madrid<br>Prof. Dr. Petra Amparo López Jiménez, Technical University of Valencia<br>Marta Ferreres, Student, University of Barcelona<br>Josep Maria Sole Fauste, Agrolimen SA i Borges SA | | | | |

[1] ASIIN Seal for degree programmes;
[2] TC: Technical Committee for the following subject areas: TC 01 – Mechanical Engineering/Process Engineering, TC 05 – Physical Technologies, Materials and Processes, TC 09 – Chemistry

| | |
|---|---|
| **Representative of the ASIIN headquarter:**<br><br>Rainer Arnold | |
| **Responsible decision-making committee:**<br><br>Accreditation Commission for Degree Programmes | |
| **Criteria used:**<br><br>European Standards and Guidelines as of 15.05.2015<br><br>ASIIN General Criteria as of 28.03.2014<br><br>Subject-Specific Criteria of Technical Committee 01 – Mechanical Engineering/Process Engineering as of 09.12.2011 | |

# B Characteristics of the Degree Programmes

| a) Name | Final degree (original/English translation) | b) Areas of Specialization | c) Corresponding level of the EQF[3] | d) Mode of Study | e) Double/Joint Degree | f) Duration | g) Credit points/unit | h) Intake rhythm & First time of offer |
|---|---|---|---|---|---|---|---|---|
| Màster Universitari en Enginyeria Ambiental i Sostenibilitat Energètica | Master of Engineering M.Eng. | - | 7 | full time, part time | no | 3 Semester | 90 ECTS | September, 2016/17 |
| Màster Universitari en Enginyeria Química | Master of Engineering M.Eng. | - | 7 | full time, part time | no | 3 Semester | 90 ECTS | September, 2013/14 |

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

For the Master's degree programme Environmental Engineering and Sustainable Energy (MEAiSE), University Rovira i Virgili (URV) has presented the following profile in the Self-Assessment Report:

"The aim of the master's degree is to prepare professionals in the field of energy, environment and sustainable production with rigorous scientific and technical background, capable of providing a flexible and multidisciplinary response to the challenges of building a sustainable society through the conception, design, evaluation, implementation and management of environmentally friendly processes, consumption of natural resources and health."

For the Master's degree programme Chemical Engineering (MEQ), University Rovira i Virgili (URV) has presented the following profile on its webpage:

"This master's degree aims to take graduates beyond their bachelor's degree and acquire a higher level of expertise in chemical engineering. Graduates will be highly trained in designing products and processes related to chemical engineering. They will also have a strong professional grounding because their work placement and master's theses will be conducted primarily in the chemical industry (i.e. in companies and organisations outside the university)."

# C Peer Report for the ASIIN Seal

## 1. The Degree Programme: Concept, content & implementation

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

**Evidence:**

- Objectives-Module-Matrix
- Self-Assessment Report
- Study plans
- Module descriptions
- Webpage University Rovira i Virgili: https://www.urv.cat/en/
- Webpage School of Chemical Engineering: https://etseq2.urv.cat/etseq/en/15-ensenyaments.html
- Webpage Ma Chemical Engineering: https://www.urv.cat/en/studies/master/courses/chemical-engineering/
- Webpage Ma Environmental Engineering and Sustainable Energy: https://www.urv.cat/en/studies/master/courses/environmental-engineering/Webpage Ma Analytical Chemistry https://www.iqs.edu/en/masters/master-analytical-chemistry

**Preliminary assessment and analysis of the peers:**
The peers refer to the Subject-Specific Criteria (SSC) of the Technical Committee Mechanical Engineering/Process Engineering as a basis for judging whether the intended learning outcomes of the Master's degree programmes Environmental Engineering and Sustainable Energy and Chemical Engineering as defined by URV correspond with the competences as outlined by the SSC. They come to the following conclusions:

For the award of the ASIIN subject-specific label and the EUR-ACE® label, distinctive learning outcomes have to be achieved by second cycle programmes. The intended learning outcomes describe the knowledge, understanding, skills, and abilities, which a graduate should acquire during the degree programme. As defined in the SSC of TC 01, they refer to

the following areas: Knowledge and Understanding, Engineering Analysis, Engineering Design, Investigations and Assessment, Engineering Practice, and Transferable Skills. The SSC are the result of an assessment, regularly performed by ASIIN Technical Committees, which summarise what is considered as good practice by a professional community formed equally by academics and professional practitioners in higher education and is required as future-oriented quality of training in the labour market. Since both Master's degree programmes under review have a focus on the different areas of engineering they are overseen by the Technical Committee 01 – Mechanical Engineering/Process Engineering.

With respect to MEQ, the peers confirm that the programme's objectives related to Knowledge and Understanding are covered by courses such as "Materials and Nanostructures", "Advanced Transport Phenomena", "Advanced Thermodynamics and Molecular Simulation", "Advanced Separation Processes" and "Reactor Engineering"

The areas Design and Analysis in Engineering are covered by the courses "Product and Process Design I", "Product and Process Design II", "Industrial Leadership" and Managing Change." The learning outcomes of these courses have an important R&D component.

Regarding the learning outcomes related to Engineering Practise, the second year courses "Work Placement" and "Master's thesis" play a key role as they mainly contribute to this competence area. However, certain first year courses include practical problems and "hands on" activities.

The competences related to "Investigations and Assessment" are imparted in courses such as "Product and Process Design I", "Product and Process Design II", "Management and Administration of Companies", "Auditing and Industrial Certification" and "Master's thesis". Here, students need to demonstrate their ability to identify, locate and obtain data, e.g. by conducting literature searches, and consulting databases. This should enable students to pursue detailed investigations and research complex technical issues.

As for the learning outcomes related to Transferrable Skills, they are developing progressively throughout the Master's programme. However, the two classes "Industrial Leadership" and "Managing Change" have a large share in covering the relevant competences.

As the peers observe, in MEAiSE the intended learning outcomes linked with "Knowledge and Understanding" are mainly covered by the courses "Advanced Water Treatment", "Atmosphere and Air Pollution", "Environmental and Energy Economics" and "Environmental and Energy Legislation".

The areas Engineering Design and Engineering Analysis in Engineering are mainly treated in the courses "Eco-efficient Process Design", "Energy Efficiency in Industry and Transport",

"Energy Efficiency in Buildings", "Management and Valorisation of Wastes" and "Renewable Energy Technologies."

Learning outcomes linked with Investigations and Assessment are distributed among different courses such as "Environmental and Energy Economics", "Environmental and Energy Management", "Sustainability Tools", and Eco-efficient Process Design.

"Master's thesis" and "Work Placement" are focusing on Engineering Practise, but also most of the courses of the first year include tasks involving practical problems and hands-on activities.

Finally, Transferable Skills are mainly conveyed by the integrated project "Eco-efficient Process Design". In this project, students should acquire skills related to team work, leadership, work in multidisciplinary and international teams and conflict resolution.

In summary, the peers see that students of both Master's degree programmes integrate all the knowledge and abilities acquired during the first year and need to demonstrate the command of the necessary competencies in the second year, by conducting an internship (Work Placement) and the Master's project.

Based on the Self-Assessment Report and the discussions during the online audit, the peers see that graduates of both Master's degree programmes acquire the necessary subject-related competences. They have advanced their knowledge in the core engineering subjects, and are qualified to carry out independent scientific and practical work in the field of engineering. Furthermore, graduates are able to solve subject-relevant problems and to present the results, have trained their analytical and logical abilities, and have an awareness of possible social, ethical and environmental effects of their actions. During the course of their studies, students have also acquired the necessary social competences, such as the ability to work in a team, to present and discuss results, and to communicate with other experts. Therefore, graduates are also prepared to take on leadership responsibilities.

In summary, the auditors are convinced that the intended qualification profiles of both Master's degree programmes under review allow graduates to take up an occupation, which corresponds to their qualification. The degree programmes are designed in such a way that they meet the objectives set for them. The peers judge the objectives and learning outcomes of the Master's degree programmes suitable to reflect the intended level of academic qualification (EQF 7) and to correspond with the ASIIN Subject-Specific-Criteria (SSC) of the Technical Committee 01 – Mechanical Engineering/Process Engineering. URV has provided Objectives-Module Matrices for both programmes that make transparent how the SSC are reflected in the respective curriculum. Analyse of the matrices confirms that the degree programmes are in line with the SSC and all subject-specific criteria are

adequately represented. The peers appreciate that URV aims for high standards as to provide their graduates with promising prospects in the national and international job market as well as a good starting point for continuing their academic education in the course of a PhD-programme. As confirmation of the previous impressions, the employers indicate that they are satisfied with the qualification profile of the graduates of both Master's degree programmes and their professional performance on the job.

The auditors judge the prerequisites for awarding the EUR-ACE® label, which has also been applied for, to be fulfilled by both Master's degree programmes under review.

## Criterion 1.2 Name of the degree programme

**Evidence:**

- Self-Assessment Report

**Preliminary assessment and analysis of the peers:**
The auditors hold the opinion that the English translation and the original Spanish names of the Master's degree programmes correspond with the intended aims and learning outcomes as well as the main course language (English).

## Criterion 1.3 Curriculum

**Evidence:**

- Objectives-Module-Matrix
- Self-Assessment Report
- Study plans
- Module descriptions
- Webpage University Rovira i Virgili:
  https://www.urv.cat/en/
- Webpage School of Chemical Engineering:
  https://etseq2.urv.cat/etseq/en/15-ensenyaments.html
- Webpage Ma Chemical Engineering:
  https://www.urv.cat/en/studies/master/courses/chemical-engineering/

- Webpage Ma Environmental Engineering and Sustainable Energy: https://www.urv.cat/en/studies/master/courses/environmental-engineering/Webpage Ma Analytical Chemistry https://www.iqs.edu/en/masters/master-analytical-chemistry

**Preliminary assessment and analysis of the peers:**
The Master's degree programmes Environmental Engineering and Sustainable Energy and Chemical Engineering are both offered by the School of Chemical Engineering (ETSEQ).

Both Master's degree programmes are taught in English.

The curriculum of the Master's degree programme Chemical Engineering consists of 90 ECTS credits, with 51 ECTS credits for compulsory courses, 9 ECTS credits for electives, 15 ECTS credits for the Work Placement and 15 ECTS credits for the Master's thesis (Trabajo de final de Master, TFM). The courses are grouped in three module blocks:

Module Block I: Process and Product Engineering, 45 ECTS;

Module Block II: Management and Optimization of Production and Sustainability, 15 ECTS;

Module Block III: Master's thesis and Work Placement, 30 ECTS.

Core subjects in chemical engineering and more specific aspects of the degree are distributed evenly between the first two semesters. To this end, two fundamental core subjects ("Advanced Transport Phenomena" and "Advanced Thermodynamics and Molecular Simulation") are scheduled in the first semester, while the two process orientated core subjects ("Advanced Separation Processes" and "Reactor Engineering") have been included in the second semester. The courses "Process Design and Products I" and "Process Design and Products II" as well as the courses "Industrial Leadership" and "Change Management" require a coordination between the first and second semester because they built on each other. The second year is entirely dedicated to projects and the practical application of engineering sciences (Master's thesis and Work Placement).

The peers notice that there are only 3 electives offered in MEQ. This means that students have no real choice because they need to attend all three elective in order to cover a total of 9 ECTS. Consequently, there are no electives but only compulsory courses. The programme coordinator verifies this observation and explains that they are planning to offer additional electives to cover other areas of interest such as energy. For this reason, they consider to offer some courses from MEAiSE as additional electives in MEQ. The auditors support this plan, however, they stress that it is necessary to offer additional electives because students need to be able to define an individual focus and course of study.

The MEAiSE curriculum consists of 90 ECTS credits, with 51 ECTS credits for compulsory courses, 9 ECTS credits for electives, 12 ECTS credits for the Work Placement and 18 ECTS credits for the Master's thesis. The curriculum contains the following module blocks: Fundamentals of Environmental and Energy Management (9 ECTS), Energy Engineering (13.5 ECTS) Environmental Engineering (13.5 ECTS), Sustainability in Process Design (15 ECTS), Electives (9 ECTS), Industrial Internship (Work Placement, 12 ECTS) and Master's thesis (18 ECTS).

The peers observe that there is one elective in MEAiSE with 4.5 ECTS (Management and Administration of Companies). All other electives have 3 ECTS, therefore, students that choose this elective will achieve 10.5 ECTS as electives and not only 9 ECTS as necessary. The programme coordinator confirms that there is only one elective with 4.5 ECTS. This course is shared with the MEQ, where it is offered as a compulsory subject. The peers see that it is more efficient to offer one course for both Master's degree programmes, but the solution to have just one elective with 4.5 ECTS is not ideal. If students choose this elective, they will have 1.5 ECTS too much. For this reason, the auditors suggest to reduce the scope of the course for MEAiSE students, e.g. by cancelling some assignments, so that the workload is equivalent to 3 ECTS.

In the final semester of both Master's degree programmes an internship (Work Placement) and the Master's thesis (TFM) are conducted. Both are usually carried out as a single, long-term project (about five months) in the industry. This way, students get some valuable work experience that improves their job perspectives. In some cases, the company offers the student a contract at the end of the TFM.

Part time studies are possible in both Master's degree programmes. Some students (around 7 %) take this opportunity because they have to work besides studying in order to finance their studies and living expenses. Part time students have a reduced workload and usually need four semesters before starting with the Work Placement and the Master's thesis.

The information about the curricula of both Master's degree programmes, as well as the bridging courses (for students that need to take additional courses, because their Bachelor's degree does not cover all necessary areas), are available on the programmes' webpages.

The external work experience programme (internship) is compulsory. The aim is for students to apply and supplement the competences they have accumulated during the first year of the degree programme so that they can acquire the practical abilities that will prepare them for a professional career, improve their employment prospects, and stimulate their entrepreneurial skills.

The work experience programme usually takes 4 - 6 months (from July or September to January) and students work in companies such as Repsol, Technip, SCA, Clariant, DOW, in research centres like IREC or IMDEA, or the university. Students do their Master's thesis at the same time, with a joint workload of 600 hours.

The peers gain the impression that the graduates of both Master's degree programmes under review are well prepared for entering the labour market and can find adequate jobs in several different areas such as: food industry, pharmaceutical and chemical companies, research institutes, and federal or state ministries. During the discussion with the peers, URV's partners from the industry confirm that the graduates have a broad technical education, are very adaptable, and have manifold competences which allows them to find suitable jobs.

In summary, the auditors are convinced that the intended qualifications profiles of the Master's degree programmes under review allow the students to take up an occupation that corresponds to their qualification.

**Criterion 1.4 Admission requirements**

**Evidence:**

- Self-Assessment Report
- Webpage University Rovira i Virgili: https://www.urv.cat/en/
- Webpage School of Engineering: https://etseq2.urv.cat/etseq/en/15-ensenyaments.html
- Webpage Ma Chemical Engineering: https://www.urv.cat/en/studies/master/courses/chemical-engineering/
- Webpage Ma Environmental Engineering and Sustainable Energy: https://www.urv.cat/en/studies/master/courses/environmental-engineering/Webpage Ma Analytical Chemistry https://www.iqs.edu/en/masters/master-analytical-chemistry
- URV Study Regulations (NORMATIVA ACADÈMICA DE GRAU I MÀSTER)
- URV Enrolment Regulation (NORMATIVA DE MATRÍCULA DE GRAU I MÀSTER)

**Preliminary assessment and analysis of the peers:**
According to the Self-Assessment Report, the admission procedures and policies for new and returning students are defined in the study regulations which are published in Spanish on URV's webpage and thus accessible for all stakeholders.

As well as the compulsory general documentation (Identification, CV, Diploma/Bachelor's certificate) required for enrolment at URV, students must submit a letter of motivation and a proof of English proficiency (level B2). Optionally, a proof of training or professional experience relevant to the content of the Master's degree programme, and recommendations or letters of reference.

MEAiSE is aimed at students with a background in the field of engineering and architecture or in the field of science. In detail, the following students can be admitted to the Master's degree programme: Graduates (Diplomas or Bachelor's) in the fields of chemistry, mechanics, industrial engineering, agriculture, physics, mining, automation and industrial electronics, electrical engineering, architecture, biology, biochemistry, biotechnology, and related areas. The Admission Committee evaluates the curriculum of the candidates, and according to their background, they may be requested to enrol in subjects from the "Homogenization Block" and in bridging courses. This is necessary because the range of subjects in MEAiSE is very broad - chemical/mechanical basics, ICT tools, renewable energies, energy efficiency, chemical industrial processes, and management of companies. Additional courses are designed to ensure that the access profile and academic merits of new students are aligned with the needs of MEAiSE. Bridging courses (up to a maximum of 15 ECTS, of which 9 ECTS can be recognised as electives) must be completed before the start of the second semester of the Master's programme. All applications are analysed by the Admission Committee, which will assess the student's academic record and qualification, previous training in relevant disciplines of the Master's programmes, the knowledge of English, and specific training courses. If the number of applicants exceeds the available places, the committee will decide about the admission based on the weighting of the above mentioned criteria: academic qualification (a degree in the field of engineering: up to 30 points, a degree in the field of sciences and architecture: up to 20 points), academic record (up to 60 points), previous training (up to 5 points), and recommendations/references (up to 5 points).

In 2018/19, 63 students pre-registered for MEAiSE, 41 were admitted and 28 registered. As in previous years, the number of enrolled students covered almost all offered places (30). MEAiSE is popular with international students who apply at several universities and sometimes have problems with their visa or face financial problems. Consequently, more students are accepted because several will not start with the programme. Considering the total number of students enrolled (first and second year), 46 % are international students.

As described in the Admission Regulation, MEQ is designed for “graduates in chemical engineering or in a similar field, or with a university degree that qualifies graduates to practice as professional technical industrial engineers specialized in industrial chemistry or a similar field”.

In practice, these admission criteria imply that students with a Bachelor’s degree, whose engineering specialty is not chemical engineering, need to take at least 30 ECTS of bridging courses in chemical engineering. However, the number of credits may be higher depending on the student’s academic record. For example, for students with a Bachelor’s degree in chemistry, the maximum number of bridging courses is 60 ECTS. The assignment of the additional courses is determined for each particular student. Since 2015/16, all new students entered MEQ with the preferred Bachelor’s degree in chemical engineering and without the need for attending any additional bridging courses.

The selection criteria and processes are similar for both Master degree programmes. However, the weighting of the different selection criteria is slightly different in MEQ. Applicants receive up to a maximum of 30 points for Bachelor’s degree in engineering and up to 25 points for a Bachelor's degree in science or architecture. The evaluation of the transcript of the official university degree that gives access to the Master's programme (academic record) contributes up to 40 points. English proficiency higher than level B2 contributes up to 10 points, training related with the content of MEQ or professional experience up to 10 points, and other activities, such as foreign stays, motivation, recommendation letters, and personal interview up to 10 points.

The number of applications in MEQ (between 50 and 64 since 2015/16) is significantly higher than the number of available places (30). Therefore, the Admission Committee, as a selection body, has established an interview procedure to appropriately guide the admission process and thus minimize the risk of exceeding capacity or leaving vacancies. As a result, an average of 25 new students were enrolled over the last four years.

The attractiveness of both Master’s degree programmes is due to the strong cooperation of the two programmes with the chemical industry and the concept on an integrated Work Placement and Master’s thesis, conducted externally in a company. This provides graduates with excellent contacts in the industry and thus very good career prospects.

Since URV is a public university, the study fees of the Master's degree programmes are set every year by the Catalan government. The price per ECTS credit set by the Catalan government is currently € 46. However, some Master’s degree programmes have special prices. The auditors notice that the tuition fees for both Master’s programmes are different. As mentioned on the webpage of the School of Chemical Engineering, currently, the fee for MEQ is € 2.885 and for MEAiSE € 4.442. The programme coordinators explain that in Spain

for some degree programmes (mostly for programmes that qualify for regulated professions such as architects and engineers) the tuition fees are lower than for other degree programmes. This is the case for MEQ but not for MEAiSE. Consequently, MEQ has lower tuition fees than MEAiSE. The decision regarding for which degree programmes the fees are lowered, lies with the Spanish government and it is politically motivated. Further details about the tuition fees are published on URV's webpage.

In MEQ, there is the initiative *ETSEQ Work Experience*. Each of the collaborating companies signs an agreement with ETSEQ by which the company gives a student of MEQ a scholarship. Every year, this programme awards nine prizes for the best chemical engineering undergraduate students which covers the tuition fees for the first year of the Master's degree. In the second year, the winners are offered a remunerated project that integrates the Work Placement with the Master's thesis that they carry out within the company. This often leads to employment opportunities.

At present, the programme *ETSEQ Work Experience* provides a total of nine prizes sponsored by companies: Dow, BASF, BSP, Clariant, Covestro, Essity, Messer and Technip.

During the audit, the peers learn that as of this year (2020), the work experience programme is also offered to MEAiSE students. This information is also published on the School's webpage. The auditors welcome this further development which will promote the degree programme and facilitate the students' financing of their studies.

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

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

The peers support the plans to include additional elective in MEQ for example out of the area of hydrogen technology. They expect URV to document that electives with more than 9 ECTS point are offered so that students have a real choice.

The peers appreciate that URV has adapted the content of the course "Management and Administration of Companies" so that MEAISE students who take this course will have a reduced work-load of 3 ECTS point, without significantly affecting the achievement of the intended learning outcomes.

The peers consider criterion 1 to be mostly fulfilled.

# 2. The degree programme: structures, methods and implementation

**Criterion 2.1 Structure and modules**

**Evidence:**

- Self-Assessment Report
- Study plans
- Module descriptions
- URV Mobility Regulation
- Educational guides (MEMORIA PARA LA SOLICITUD DE VERIFICATION DE TITULUS OFICIALES DE MASTER)

**Preliminary assessment and analysis of the peers:**
After analysing the module descriptions and the study plans, the peers see that in both Master's degree programmes the individual courses correspond with the definition of "module" in the sense that each course is a sum of coherent learning and teaching units.

The arrangement of the courses is presented in the educational guide and the intended learning outcomes of each course are specified in the respective module description. The educational guide defines in which course the necessary competencies are acquired and how the related learning outcomes are evaluated. In addition, the module descriptions, which are accessible via Moodle, describe in detail the content, training activities, projects, works, seminars as well as the educational and assessment methods of each course.

During the second year, students usually carry out the Master's thesis and Work Placement together in a long-term integrated project (about 4-6 months) of a professional nature in the industry or research centre, which helps to achieve the planned learning outcomes in addition to facilitating the subsequent employment of the student. Students are monitored by a thesis supervisor from URV and by an external supervisor from the company. Companies that host students for both PE and TFM offer the required educational and technical environment for achieving the intended learning outcomes. The tasks of the URV supervisor are to help the student in finding and defining a suitable final project, to supervise the development of the project, and to evaluate the execution and the results. The assessment of the TFM includes the presentation of a written report and an oral presentation to a three-member jury.

*International Mobility*

URV's *International Centre* manages the international mobility of students, administrative staff and teachers with the aim of increasing URV's international visibility of URV, promoting internationalisation of the university and attracting qualified international students and staff members. The *International Centre* is as a centralised unit that manages the documentation and information of all the processes involved in the internationalisation of URV. It offers support to all students, teachers, and administrative staff who want to spend some time abroad, and is the first port of call for all visiting international students and staff members. In addition, there is a mobility coordinator in every faculty and school.

ETSEQ takes an active part in various programmes in order to promote student exchanges with other universities in Spain (e.g. Sicue-Seneca programme), and in the European Union, as part of the Erasmus programme. URV is also constantly and actively seeking exchange agreements with universities from outside Europe, such as the United States and Latin America. The list of agreements is changing constantly, the updated information is published on URV's webpage.

Students who wish to visit another university or foreign institution need to get in touch with their mobility coordinator or Master's degree coordinator. Usually, a learning agreement between the student and the programme coordinator is signed in order to define what courses will be attended during the stay abroad, and to make sure that all credits acquired at the international university are recognised. Further details are described in URV's mobility regulation.

Students can go abroad during the second year, within the framework of the Work Placement and the Master's thesis. Students are informed during the tutoring meetings about the different possibilities for scholarships that they can apply for and the related procedures. As a result, every year several students (between 10 and 15 %) follow this option and go to international companies such as P&G, DOW, or BASF.

As described in the Self-Assessment Report, ETSEQ has a long tradition of mobility agreements for both incoming and outgoing students. For example, there are MoU with universities in Japan, Indonesia and USA. Erasmus co-operations exist with universities in Belgium, France, Germany, Italy, Netherlands, Poland, Slovenia, and UK.

The procedure for recognising academic competences acquired at other (also foreign) institutions of higher education is described in the Mobility Regulation. Students have to submit proper documentation of the competences obtained elsewhere; an academic board analyses the documents and decides if the competences can be recognised as equivalent to certain courses. The peers judge the process to be in line with the Lisbon convention on the recognition of qualifications.

## Criterion 2.2 Work load and credits

**Evidence:**

- Self-Assessment Report
- Study plans
- Module descriptions
- Statistical data

**Preliminary assessment and analysis of the peers:**
The auditors see that URV applies the European Credit Transfer and Accumulation System (ECTS). According to URV's regulations, 25 hours of student workload (including lecture hours and self-study hours) are equivalent to one ECTS credit. The auditors confirm that the information about the workload in hours (including the distinction between classroom work and self-studies) is available to the students. However, the peers point out that this information should also be included in the module descriptions.

In addition, the auditors observe that in some courses (MEQ) the conversion in ECTS is not done correctly. For example, in "Management and Administration of Companies" 4.5 ECTS are awarded for 112 hours of students' total workload, in "Auditing and Industrial Certification" 4.5 ECTS for 113 hours, in "Product and Process Design II" 4.5 ECTS for 113 hours, and in "Polymers" 3 ECTS for 76.6 hours. The auditors expect that the ECTS workload conversion is done correctly for all courses so that it is exactly 1 ECTS per 25 hours of students' total workload.

The dropout rates in both Master's degree programmes are rather low since almost all students stay in the programmes and only very few students decide to leave ETSEQ. The estimated and actual values of the graduation and dropout rates are described in the Self-Assessment Report for the four academic years from 2015/16 to 2018/19. For MEQ, the data shows that the dropout is rather low, with an average of 6.5 % in the last three years and an average length of studies of 2.0 years. The numbers are similar for MEAiSE; here the average length of studies is 2.07 years.

The peers notice that the Self-Assessment Report does not include any drop-out rates for MEAiSE. The programme coordinators explains that MEAiSE was implemented in 2016; the first academic year for which this indicator can be provided is the academic year 2019/20. However, due to the COVID restrictions, the academic year 2019/20 will end in November 2020. To help students to finish their final project the semester was prolonged. For example, two MEAiSE students will defend their Master's thesis in November, and the corresponding marks will be available on 30th of November. Consequently, the drop-out for the

academic year 2019/20 is only provisional. However, from the provisional data, the peers see that the drop-out rate is low (only around 6 %).

In general, students confirm that the workload in MEQ and MEAiSE is high but still adequate for a Master's programme. The only critical aspect they point out is that students in MEAiSE would like to have a say when groups are assigned and that teachers are more open if a group does not function well. In addition, the workload should be better coordinated between the different classes that there are not several assignments due at the same time. The peers support this point of view and suggest that the teachers should coordinate the group assignments better in order to avoid peaks in the workload.

Based on the study plans, the statistical data, and the comments of the students, the auditors conclude that there are no obstacles to the quality of teaching and the level of education due to the workload.

**Criterion 2.3 Teaching methodology**

**Evidence:**

- Self-Assessment Report
- Study plans
- Module descriptions

**Preliminary assessment and analysis of the peers:**
Both Master's degree programmes under review are face-to-face degrees with a duration of 1.5 years, which make use of several different educational methods for each course such as: practical work with presentations, group work, lectures, seminars, internship, and final project.

ETSEQ's educational model is intended to actively involving students in the learning processes, and focuses on continuous assessment. Training activities and assessment forms applied in the courses have a high practical component, which should facilitates the acquisition achievement of the intended learning outcomes.

In MEAiSE, students are involved in project realisation, problem solving, and case studies. Students learn to work with process simulators such as Aspen or Hysys, software for life cycle analysis such as GaBI or DesignBuilder. For the design of energy efficient buildings or water treatment process simulators such as DESASS are used.

MEQ students are also involved in practical activities that should help them to assimilate the theoretical concepts by applying them to solve problems in the field of chemical engineering. In problem solving activities and case studies, students learn to work with process simulators or computer programs such as Aspen, Hysys, Gamps, COMSOL, Monte Carlo, Matlab, etc., which are essential work tools for modern chemical engineers.

In particular, both Master's degree programmes have a distinct practical and professional profile which is not only implemented by training activities of the first year courses but especially by the integrated Work Placement and Master's thesis in the second year.

There is a digital learning platform (Moodle) that is used by teachers and students for presenting documents and interacting with each other. Group projects with oral presentations are conducted in several courses and the Master's thesis is supposed to familiarise students with independent academic research activities. Generally, students are satisfied with the existing teaching methods.

In summary, the auditors consider the applied teaching methods and the underlying didactic concept as appropriate and useful for supporting the students in achieving the intended learning outcomes.

**Criterion 2.4 Support and assistance**

**Evidence:**

- Self-Assessment Report

**Preliminary assessment and analysis of the peers:**
The School of Chemical Engineering uses the *Tutorial Action Plan* (PAT) to monitor and guide students. In Master's degree programmes, PAT is centred on the programme coordinator who acts as academic advisor. The role of the advisor is to help students with the process of orientation during the first semester, to offer academic advice, make suggestions regarding relevant careers and the choice of the Master's thesis. Students confirm during the discussion with the peers that they meet regularly with their advisor and that they can always contact them and ask for advice.

To welcome new students, ETSEQ organises a *Welcome Event* at the beginning of the academic year. The event consists of an open meeting between students and lecturers of the Master's degree programmes in an informal environment that encourages communication between students and teaching staff, and contact between students of different degrees.

URV provides a *Psychological Guidance Service* for all of its students. The *Unit of Psychological Consultancy and Support to Students* (UASPE) is a free service that gives confidential

advice to students so that they can better adapt to university life, become emotionally stable, improve their academic performance or discuss the possibilities of initiating a psychological treatment. When advisors detect that students may need this service, they recommend to contact UASPE. In addition, anybody who wishes to use the service can request an appointment.

For careers guidance, URV has established the *Career Guidance Service*, which aims to provide students and alumni with a career development programme. Through training programmes, workshops, and individual sessions, students are supported in acquiring and using appropriate strategies to plan and pursue their professional and personal development. *Career Guidance Service* includes a service form alumni with the aim of keeping in touch with former students and following and supporting their professional career. The *University Job Fair* is organised on an annual basis. It serves as a meeting point between students and alumni on the one hand and possible employers on the other hand. URV provides a *Job Bank*, which is a platform for students and alumni to manage their CVs and for employers to announce job opportunities.

It is also worth noting the seminars given at the School of Chemical Engineering, both for their number and for the topics covered and the participating speakers who undoubtedly contribute to the complete training of students.

The peers learn that the members of the teaching staff and especially the programme coordinators are available for any issues regarding the degree programmes and offer academic advice. They appreciate this “open door policy” and also notice the good and open-minded relationship between students and teaching staff. There are enough resources available to provide individual assistance, advice and support for all students. The support system helps students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them.

The auditors especially appreciate the dedication and motivation of the programme coordinators and their commitment to the students. They are always accessible for the students and open to suggestions. The auditors are impressed by the atmosphere of understanding and support at the School of Chemical Engineering. The small classes and the good and trustful relation between students and the programme coordinators is one of the strong points of the degree programmes.

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

The peers appreciate that the MEAiSE programme coordinator has developed an excel file to be completed by all professors of the Master's programme with information about all the assignments. The programme coordinator will analyse this information in order to identify possible peaks in the workload and, if needed, ask professors for rearranging the scheduling of the tasks.

The peers confirm that the discrepancies between the students' workload and the awarded ECTS points have been corrected in the Teaching Guide for the 2020-21 academic year. For this reason, they see no reason for issuing a requirement to this respect.

The peers thank URV for pointing out that the opening hours of the library were only reduced due to the COVID pandemic. The previous opening hours are sufficient.

The peers consider criterion 2 to be fulfilled.

# 3. Exams: System, concept and organisation

**Criterion 3 Exams: System, concept and organisation**

**Evidence:**

- Self-Assessment Report
- Module descriptions
- Study plans
- Exam schedules
- Regulation of Exams

**Preliminary assessment and analysis of the peers:**
According to the Self-Assessment Report, the students' academic performance is evaluated on the basis of their laboratory works, reports, presentations, homework exercises, and written exams. The contribution of each form of assessment to the final grade is mentioned in the detailed module descriptions that are available to the students.

All courses, except for the Work Placement, have two examination attempts: the first attempt is based on the continuous assessment, and usually includes one or more exams (accounting for up to 50 % of the total mark in most of the subjects) and different tasks (hand-out activities, reports, and oral presentations). The second attempt is a re-sit of those activities (either exams or tasks) that have not been passed in the first call. If a stu-

dent fails in the second call, she/he will have to re-enrol in the course in the following academic year. Since the academic year 2019-2020, the Master's thesis also allows for two attempts.

Although there are a lot of different assessments, the students judge the amount of exams to be acceptable and the examination load to be adequate. The students confirm that they are well informed about the examination schedule, the examination form and the rules for grading.

Work Placement (internship) should allow students to apply and complement the competencies acquired in their academic training. It should better prepare them for professional practice and facilitate their employability. During the internship, students have two supervisors: one in the company or research centre where they are doing their internship, and an academic tutor from URV, who will ensure the academic quality of the internship.

Assessment of the Work Placement includes an internship report (60 % of the final grade) and external supervisor report (productivity, initiative, creativity, responsibility, cooperation, communication, quality of work, and knowledge of languages, 40 % of the final grade).

Every year, ETSEQ needs between 20-25 projects for the Master's thesis in each programme. Companies that participate in the Work Experience programme offer directly projects to the students. For the rest, the programme coordinator contacts different companies or research institutes mainly in the area of Tarragona but also in Barcelona or Castellon, asking for project proposals to host one student to do the internship and Master's thesis with them. The contacted companies mainly belong to the chemical industry sector, energy, environmental consulting, engineering, water treatment and supply, or research centres on related topics, offering development and innovation projects in the industry.

All the project proposals that are gathered by the programme coordinator are presented to the students in Moodle. Students are requested to fill in a "Project Selection Application" form, to express their preferences. After processing this information, the programme coordinator contacts the companies and sends them the CVs of the interested students that fulfil their requirements. Afterwards, the selection process by the companies starts with personal interviews. Once the companies complete the selection process, they inform the coordinator about the result. If they finally reach an agreement with the student, an internship agreement document is signed by the ETSEQ, the company, and the student.

In addition to this procedure, students can also contact companies and research institutes by themselves and propose a project. In the case, they are requested to provide information about the objectives of the project. If the programme coordinator validates the proposal, an agreement is signed and the project can be started.

In the unusual event that it is not possible to find a suitable final project for a student, ETSEQ's research groups are asked to propose a project.

Presentation and defence of the Master's thesis will be evaluated by a jury usually made up of three people: the academic tutor, the industry tutor and another professor from URV (or another person from the company where the student has performed the internship). Assessment of the Master's thesis includes the project report (60 % of the final grade), oral project presentation (presentation of findings and conclusions, 20-25 min, 20 % of the final grade), and project defence (debate with the jury for a maximum of 60 min, 20 % of the final grade).

The peers also inspect a sample of Master's theses and are overall satisfied with the general quality of the samples.

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

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

The peers consider criterion 3 to be fulfilled.

# 4. Resources

**Criterion 4.1 Staff**

**Evidence:**

- Self-Assessment Report
- Staff handbook

**Preliminary assessment and analysis of the peers:**
URV provides information about the members of the teaching staff in Moodle. Here, information on the academic profile and qualifications of the teaching staff and their CVs can be accessed. For each lecturer, students can see a general profile of every teacher with the most important professional data, the courses they have taught over the previous five years, and their research activities. In addition, information on teaching and research staff is made public on the programme's website during the period of pre-enrolment.

The teaching staff of MEAiSE consists of 25 professors (6 full professors, 10 associate professors, and 9 senior lecturer). In addition, there are 18 non-permanent staff members (9 adjunct professors, 4 visiting professors, 3 postdoctoral researchers and 2 pre-doctoral trainee researchers. 81.4 % of the teaching staff have a PhD. Teachers without a PhD are associate professors or visiting professors from companies, who are experts in certain areas of the Master's degree programme. The teaching staff without a PhD teaches 14 % of the teaching hours, while 86 % of the teaching hours are taught by teaching staff with a PhD. The number of lecturers has remained practically constant within the last few years. In terms of gender, 26 % are women and 74 % men.

The teaching staff of MEQ consists of 17 professors (4 full professors, 7 associate professors, and 6 senior lecturer). In addition, there are 23 non-permanent staff members (14 adjunct professors, 2 visiting professors, and 7 pre-doctoral trainee researchers). From 2016/17 to 2018/19, a total of 22 to 25 teachers have taught the 14 first year courses of MEQ. More than 60 % of them hold a PhD doctors and they cover 80 % of the teaching load in the first two semesters. The rest of the teaching, usually at problem solving and laboratory level, falls to researchers in training. During the second academic year, PE and TFM are conducted usually in co-operation with a company. This requires an external supervisor of the company and an internal URV advisor. To this end, a total of 19 professors are involved in supervising PE and TFM as URV advisors. Of them, 9 hold a PhD. The remaining 10 teaching staff members are professionals with extensive industrial experience. They are contracted as associate professors and almost exclusively monitor projects both at undergraduate and master level. The number of academic staff members has stayed constant within the last few years and no major changes are expected in the future. In terms of gender, 15 % of the teachers in MEQ are women and 85 % are men.

The auditors discuss with URV's management how new staff members are hired. As a public university, hiring of new staff members is regulated by governmental rules. Accordingly, vacancies are publicly (international calls) announced and the departments are responsible for hiring new teaching staff in compliance with their budget. New academic staff members first receive a tenure track position for 4 to 5 years. After successfully completing the tenure track, teachers become permanent staff members as associate professors. Previous professional experience in the industry or a private company is not mandatory.

The peers see that the number of faculty members is appropriate and leads, also due to the small amount of students, to a comparatively good ratio between students and teachers. The teachers at the School of Chemical Engineering are professionally qualified and their qualification profiles fit well with the scientific focus of the degree programmes. The research and development activities correspond with the goals of the degree programmes and are well integrated into the curricula. From the auditors' point of view, there are

enough qualified academic staff members to ensure the adequate implementation of both Master's degree programmes.

During the discussion with the auditors the teachers confirm that time available for conducting research is balanced with time spend on lectures, tutoring students, and administrative tasks. Academic staff members consider their teaching load as adequate and there is enough time for conducting research activities.

In summary, the peers confirm that the composition, scientific orientation and academic qualification of the teaching staff are suitable for successfully implementing and sustaining both Master's degree programmes.

**Criterion 4.2 Staff development**

**Evidence:**

- Self-Assessment Report
- Staff handbook

**Preliminary assessment and analysis of the peers:**

During the audit, URV's management points out that the improvement of teaching quality is one of the URV's priority objectives. To this end, URV has established the *Educational Resources Service* (SREd), which provides technical and methodological support for faculty members in order to give opportunities for further education and training in terms of personnel development and qualification of the teaching staff. Its mission is to encourage the introduction and application of modern learning and teaching methods in order to improve the teaching and learning processes and make them more efficient and effective. For example, SREd offers support for implementing e-learning, blended and online courses, and online teaching. In addition, SREd helps with creating digital and audio-visual resources and contents, communication tools and videoconferences for distance-teaching and the use of the Moodle virtual campus.

For bringing together all the university services that provide IT and learning and knowledge technologies in support of learning, teaching and research, URV has established the *Learning and Research Centre* (CRAI). It provides services for all members of the URV community (students, teaching and research staff, and administrative and service staff). Part of CRAI is the *Self-access Language Centre* (EAL), which offers the whole university community support in terms of language learning in the classroom or online.

At URV, there is also the *Institute of Education Sciences* (ICE), which provides activities for teacher training. In addition, ICE takes an active part in developing university policies on

innovation and improving the quality of teaching. To this end, ICE organises and gives support to funding calls for teaching innovation projects and helps disseminating good practices in this area. ICE also manages the URV's training plan for staff members. This training plan consists of three part: General Training Plan, Specific Training Plan and the DANG Plan (teaching in English). The General Training Plan provides annual, lifelong training activities for teaching staff, such as courses, workshops, and seminars. The Specific Training Plan takes specific demands of the departments and schools into account and analyses the specific requirements of every individual teacher. The DANG Plan for teaching in English gives support to those lecturers who teach their subjects in English or who wish to start teaching in English in the near future.

A tool for encouraging and recognising teaching quality are the *Prizes for Teaching Quality*, which are awarded by URV's *Board of Trustees*. The aim is to identify and recognise the effort made by URV's teaching staff to improve teaching quality by using innovative teaching methods.

The auditors discuss with the faculty members about the existing opportunities for spending time abroad and for participating in international projects and conferences. They learn that the teachers can go abroad for research collaborations or for attending workshops and that there are enough funds available for such activities. In addition, a sabbatical is possible every seven years. This is a national regulation, but the department has to agree because the teaching load needs to be covered by the other teachers, which is difficult to arrange.

In summary, the auditors confirm that URV offers sufficient and appropriate support mechanisms and opportunities for members of the teaching staff who wish to further develop their professional and teaching skills.

**Criterion 4.3 Funds and equipment**

**Evidence:**

- Self-Assessment Report
- Video of the School of Chemical Engineering

**Preliminary assessment and analysis of the peers:**
Before the audit, the peer group receives a short video showing the teaching and research laboratories in the School of Chemical Engineering. More important, during the audit, all stakeholders (students, programme coordinators, and teachers) confirm that there are no bottlenecks due to missing equipment or a lacking infrastructure. The technical equipment for teaching the students on a Master's level and for conducting research activities are available. In addition, the programme coordinators point out that there are enough funds

for running the degree programmes adequately. They point out that in MEQ as well as in MEAiSE, most of the practical work is done in the computer labs. Here the equipment is fine and technical assistants are responsible for running the lab, maintaining the hardware, installing programmes, and updating the software.

The students also express their satisfaction with the library and the available literature there. However, they criticise that the opening hours, especially at the weekends and in the evenings, are limited. Therefore, the peers suggest that the opening hours could be prolonged during the examination periods so that students can better study and prepare for the exams.

In summary, the peer group judges the available funds, the technical equipment, and the infrastructure (labs, library, seminar rooms etc.) to comply with the requirements for adequately sustaining the degree programmes.

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

URV does not comment on this criterion in its statement.

The peers consider criterion 4 to be fulfilled.

# 5. Transparency and documentation

**Criterion 5.1 Module descriptions**

**Evidence:**

- Self-Assessment Report
- Module descriptions

**Preliminary assessment and analysis of the peers:**

URV provides detailed and comprehensive module descriptions that include all necessary information about teaching methods, awarded credit points, intended learning outcomes, content, admission and examination requirements, forms of assessment, details explaining how the final mark is calculated, and biographical references. However, the peers point out that the module descriptions do not include detailed information about the students' workload. This should be made up for.

Each course has its own teaching guide, which includes, among others, the content, teaching methodologies and the evaluation criteria linking the latter with the expected learning outcomes.

The module descriptions are accessible to all students and members of the teaching staff via Moodle and ETSEQ's webpage.

## Criterion 5.2 Diploma and Diploma Supplement

**Evidence:**

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

**Preliminary assessment and analysis of the peers:**
The peer group confirms that a Diploma Supplement is issued after graduation. It includes all necessary information about the structure and content of the respective degree programme. It also informs about the qualification gained, including the achieved learning outcomes and the level and status of the studies that were pursued and successfully completed.

## Criterion 5.3 Relevant rules

**Evidence:**

- Self-Assessment Report
- Webpage University Rovira i Virgili: https://www.urv.cat/en/
- Webpage School of Chemical Engineering: https://etseq2.urv.cat/etseq/en/15-ensenyaments.html
- Webpage Ma Chemical Engineering: https://www.urv.cat/en/studies/master/courses/chemical-engineering/
- Webpage Ma Environmental Engineering and Sustainable Energy: https://www.urv.cat/en/studies/master/courses/environmental-engineering/Webpage Ma Analytical Chemistry https://www.iqs.edu/en/masters/master-analytical-chemistry

**Preliminary assessment and analysis of the peers:**
The auditors confirm that the rights and duties of both URV and the students are clearly defined and binding. All rules and regulations are published in Spanish on the university's webpage.

The auditors point out that only some information about the degree programmes is available in English on URV's homepage. Since both MEQ and MEAiSE are taught in English and have several international students, it is necessary to provide all relevant information about the degree programmes (e.g. study and exam regulations) in an English translation for all stakeholders (e.g. by publishing them on the webpage).

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

The peers thank URV for pointing out that all relevant information (Academic regulations for Bachelor's and Master's Degree studies, Regulations for registration onto Bachelor's and Master's degree programmes, Regulations governing mobility, Regulations governing external internships) about the degree programmes are available on the programmes' webpages. For this reason they abstain from issuing a requirement to this respect.

The peers confirm that information about the students' workload is provided in the Educational Guide for each subject in the planning section.

The peers consider criterion 5 to be fulfilled.

# 6. Quality management: quality assessment and development

**Evidence:**

- Self-Assessment Report

**Preliminary assessment and analysis of the peers:**

In both Master's degree programmes different groups are involved in organising and implementing the programmes. It is essential that these groups, which includes students, teachers, administrative staff, and the programme coordinator, regularly communicate with each other. Most used channels are personal meetings, information and follow-up sessions, e-mails, and especially the digital platform Moodle.

Coordination meetings are held periodically between the teaching staff and the programme coordinator. In these meetings, proposals for improvement are discussed. In general, two coordination meetings are held at the beginning of each semester. A summary document of the main points discussed is posted in Moodle. In addition, individual meetings are held with module coordinators whenever necessary.

Regular meetings are also being held with students, mostly in the framework of individual tutoring meetings. Suggestions for improvement made by students in these meetings are transferred to the coordinators of module so that they can take them into consideration for improvement. These tutoring sessions usually take place at the end of each semester and are helpful for identifying weak points in teaching activities and organisation of the degree programme.

The peers confirm that URV's internal quality assurance system is a suitable tool for improving the quality of degree programmes. First key performance indicators are analysed for each course. Secondly, plans for improving the identified weak point are drafted and implemented.

The yearly monitoring report is based on these indicators and is the central feature in the overall analysis of the quality of the learning and teaching process of the programmes and the School of Chemical Engineering. The final result of the internal quality assurance is the school's improvement plan, which is designed to summarise the findings, proposes measures for improvement, define a timeline, and mentions responsibilities. The monitoring reports, which include the improvement plan, are available to all stakeholders on ETSEQ's website.

A students' satisfaction survey and a teaching staff satisfaction survey are conducted every semester; a graduates' survey once a year. In addition, there is a satisfaction survey for employers and external supervisors of the Work Placement and the Master's thesis. However, participation in the various surveys is low and only in a few cases above 30%.

As soon as the surveys are available, students receive an email explaining how they can access them. They will be made available on the URV's virtual campus in a specific section for surveys. Subsequently, those students who have not answered a particular survey are sent a reminder when they access the virtual campus. ETSEQ tries to increase student participation in the satisfaction surveys and wants to introduce that students spend a few minutes during one of the last classes in the semester on filling out the survey on a mobile electronic device.

The auditors discuss with URV's management, the programme coordinators, students, and graduates, why the students' participation in the satisfaction surveys is rather low. They learn that URV is interested in a higher participation and the low return quotas are

a concern not only in the School of Chemical Engineering but in all faculties. The programme coordinators try to motivate students to participate and inform them on different channels (Moodle, webpage) about the surveys. They point out that the surveys' results are accessible via Moodle and are utilized for further developing and improving the degree programmes. In addition, students can give direct feedback to the teachers and programme coordinators e.g. during the personal tutoring meetings. Since students can give a direct feedback to the programme coordinators, more formal feedback instruments (such as surveys) are not very popular with the students. One consequence of the low return rates and the small courses is the fact that results of the satisfaction surveys are not very reliable.

Another issue is the difficulty of the School of Chemical Engineering in finding student representatives for the different panels. As the programme coordinators explain, there are student representatives in the University Senate, in the board of the School of Chemical Engineering and in the Programme Coordination Committee (one programme level). Unfortunately, the motivation of students to take up such an office is low, although they receive credits for participating in the university's panels. To solve this problem and to get students more involved, URV has just recently (one year ago) introduced the system of "delegates". Each year of students elects a delegate for the degree programme who should act as link between their fellow students and the programme coordinator. Since this system is rather new, no final assessment regarding the success can be made yet.

The peers acknowledge, that employers are involved in further developing the degree programmes and that is a main concern of URV and the School of Chemical Engineering to keep a close contact with employers. For example, representatives of professional associations and companies were involve in designing both Master's degree programmes and there is an *Advisory Council* at ETSEQ. It was established in 2015. Its members are representatives of the industry, private companies, or professional associations from areas related to the programmes offered at ETSEQ. The *Advisory Council* is involved in further developing the degree programmes with a focus on the skills graduates will need in their professional lives. The close contact with employers and companies and their strong co-operation with ETSEQ is one of the strong points of both Master's degree programmes.

Finally, for the academic year 2018-19, a survey was also given to the employers on their satisfaction with ETSEQ's Master's degree students. Of the 33 employers and/or tutors of the external work placement programme 52 % responded to the survey. The peers see that employers have a very positive impression of the students and graduates and their general level of competencies (personal, professional, communicative, leadership) both during the Master's degree project or once they are working as young professionals in the company.

With regard to the future employment of students, the University undertakes several actions aimed at assisting the student in this important process. Students are offered career guidance workshops related to curriculum vitae and professional interviews. Furthermore, every year a career fair is organised. This forum provides for direct contact between companies and students to get to know each other, allowing companies to attract young talents and students to find job opportunities or internships.

The auditors observe that the courses are rather small and, consequently, there is a direct contact between programme coordinators and students and the possibility to personally discuss about deficits in the course. The auditors gain the impression that the students' feedback is taken seriously by the teaching staff and the programme coordinators and changes are made if there is negative feedback. But they think, it would also be useful to inform the students directly about the results of the satisfaction surveys. This could, for example, be done by informing the students via email about the critique and the planned changes. During the audit, students and graduates confirmed that they would like to see the direct consequences of the surveys. It would motivate them to participate if changes and adjustments are directly visible to them and if it is explained to them what consequences the surveys have.

In summary, the peer group confirms that the quality management system is suitable to identify weaknesses and to improve the degree programmes. The students are involved in the process but their participation at the satisfaction surveys and their involvement in the panels could be increased.

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

The peers appreciate that URV will make the English translation of the results of the surveys available to students in Moodle. This way, students will be able to see the feedback that has been converted into proposals for improvements and also the actions that have been designed in order to achieve them.

The peers thank URV for clarifying that only undergraduate students receive credits for their participation in the different governing bodies of the university. For Master's degree students, Spanish legislation does not provide for this type of credit recognition.

The peers consider criterion 6 to be fulfilled.

# D Additional Documents

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

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# E Comment of the Higher Education Institution (29.01.2021)

URV provides the following detailed statement:

**REPLY TO THE PEERS' IMPROVEMENT PROPOSAL**

Below can be found our comments on the proposal for improving the report, which we have considered relevant to add as "Improvement Plan ETSEQ, MEAiSE & MEQ 2020-21" given at the end of the section.

Marked in grey is a literal copy of the text of the Draft Accreditation Report ASIIN Seal & EUR-ACE® Label.

**Criterion 1.3 Curriculum**

**MEQ**

*The peers notice that there are only 3 electives offered in MEQ. This means that students have no real choice because they need to attend all three elective in order to cover a total of 9 ECTS. Consequently, there are no electives but only compulsory courses. The programme coordinator verifies this observation and explains that they are planning to offer additional electives to cover other areas of interest such as energy. For this reason, they consider to offer some courses from MEAiSE as additional electives in MEQ. The auditors support this plan, however, they stress that it is necessary to offer additional electives because students need to be able to define an individual focus and course of study.*

With respect to the proposal/offer of additional electives in MEQ, we are currently reviewing the timetables and contents of both MEAiSE (energy area) and Technology and Engineering Management (MGET) (management area) subjects which could be of interest to MChemE students. Moreover, given the increasing importance of hydrogen technology for the energy sector, we are considering including some electives related to this emerging field *(2020.21-MEQ-1.2-M1)*.

**MEAiSE**

*The peers observe that there is one elective in MEAiSE with 4.5 ECTS (Management and Administration of Companies). All other electives have 3 ECTS, therefore, students that*

*choose this elective will achieve 10.5 ECTS as electives and not only 9 ECTS as necessary. The programme coordinator confirms that there is only one elective with 4.5 ECTS. This course is shared with the MEQ, where it is offered as a compulsory subject. The peers see that it is more efficient to offer one course for both Master's degree programmes, but the solution to have just one elective with 4.5 ECTS is not ideal. If students choose this elective, they will have 1.5 ECTS too much. For this reason, the auditors suggest to reduce the scope of the course for MEAiSE students, e.g. by cancelling some assignments, so that the workload is equivalent to 3 ECTS.*

According to the suggestion of the evaluation panel, we have explored the possibility of adapting this subject to the students from the MEAISE master. As a result, from course 2021-22 on, the MEAISE students who register this subject will have a reduced workload equivalent to 3 ECTS, without affecting significantly the achievement of the defined learning outcomes. In the following table we present the distribution of tasks and work-load for MEAISE and MEQ students *(2020.21-MEAiSE-1.2-M1)*.

| Task name | Performed individually (I) or in group (G)? | #estimated hours dedicated to task/student (presentials) | #estimated hours dedicated to task/student (autonomously) | Total hours (MEQ) | Total hours (MEESE) |
|---|---|---|---|---|---|
| Magistral class | I | 30 | | **30** | **30** |
| Individual work | I | | 10 | **10** | |
| Solving problems and exercises. Project - business case | G | 15 | 13 | **28** | **26,5** |
| Solving problems and exercises. Project - business case | I | | | | |
| Partial review | G | 3 | 1,5 | **4,5** | **4,5** |
| Oral presentation | G | 6 | 10 | **16** | |
| Seminars | G | 5 | 5 | **10** | |
| Personal attention and doubts | - | 1 | 1 | **2** | **2** |
| End-of-term exam | I | 2 | 10 | **12** | **12** |
| *Total number of hours* | | | | 112,5 | 75 |
| *ECTS equivalent* | | | | *4,5* | *3* |

**MEAiSE**

*(…) The only critical aspect they point out is that students in MEAiSE would like to have a say when groups are assigned and that teachers are more open if a group does not function well. In addition, the workload should be better coordinated between the different classes that there are not several assignments due at the same time. The peers support this point of view and suggest that the teachers should coordinate the group assignments better in order to avoid peaks in the workload.*

The coordinator has developed an excel file to be completed by all professors of the master's programme with information about all the assignments (type of task, individually or in group, number of hours per student estimated to be dedicated to the task,

presencial+autonomously, date when the task is to be announced, due date). The coordinator will ask for this information before starting each semester in order to identify possible peaks in the workload and, if needed, ask professors for a rearrangement in the scheduling of the tasks *(2020.21-MEAiSE-1.4-M1)*.

**Criterion 6. Quality management: quality assessment and development**

*(…) Since students can give a direct feedback to the programme coordinators, more formal feedback instruments (such as surveys) are not very popular with the students. One consequence of the low return rates and the small courses is the fact that results of the satisfaction surveys are not very reliable.*

*(…)But they think, it would also be useful to inform the students directly about the results of the satisfaction surveys. This could, for example, be done by informing the students via email about the critique and the planned changes. During the audit, students and graduates confirmed that they would like to see the direct consequences of the surveys. It would motivate them to participate if changes and adjustments are directly visible to them and if it is explained to them what consequences the surveys have.*

The table with the proposals for improvements and actions to undertake presented in each periodic monitoring report will be translated into English and made available to students in the Coordination Space in Moodle. This way the students will be able to see the feedback that has been converted into proposals for improvements and also the actions that have been designed in order to achieve them *(2020.21-ETSEQ-3.2-M2)*. Besides this, the "Table C.1 Satisfaction of students and the percentage of participation" will also be available in the Coordination Space in Moodle *(2020.21-ETSEQ-3.2-M1)*.

## ALREADY CORRECTED ASPECTS AND UPDATE OF DATA OR INFORMATION

**Criterion 2.2 Work load and credits**

**MEQ**

*In addition, the auditors observe that in some courses (MEQ) the conversion in ECTS is not done correctly. For example, in "Management and Administration of Companies" 4.5 ECTS are awarded for 112 hours of students' total workload, in "Auditing and Industrial*

*Certification" 4.5 ECTS for 113 hours, in "Product and Process Design II" 4.5 ECTS for 113 hours, and in "Polymers" 3 ECTS for 76.6 hours. The auditors expect that the ECTS work-load conversion is done correctly for all courses so that it is exactly 1 ECTS per 25 hours of students' total workload.*

Taking into account the auditors' comments, these discrepancies have been corrected in the Teaching Guide for the 2020-21 academic year as the application does not allow changes to be made in previous courses.

However, in order for this not to happen in the future, we will ask for the new teaching guide application that is currently being developed to include an alarm that warns teachers if they plan more or less hours than those corresponding to the credits of the subject *(2020.21-ETSEQ-6.2-M1)*.

**MEAiSE**

*The peers notice that the Self-Assessment Report does not include any drop-out rates for MEAiSE. The programme coordinators explains that MEAiSE was implemented in 2016; the first academic year for which this indicator can be provided is the academic year 2019/20. However, due to the COVID restrictions, the academic year 2019/20 will end in November 2020. To help students to finish their final project the semester was pro-longed. For example, two MEAiSE students will defend their Master's thesis in November, and the corresponding marks will be available on 30th of November. Consequently, the drop-out for the academic year 2019/20 is only provisional. However, from the provi-sional data, the peers see that the drop-out rate is low (only around 6 %).*

The drop-out rates have been calculated according to the official formula, which is (n = duration in years of the curriculum):

Drop-out rate: No. of students not registered in the final year "t+1"

----------x100

No. of students registered in year t-n+1

According to this formula, and since the master MEAiSE was implemented in 2016, the first academic year for which this indicator can be provided is the academic year 2019-2020. However, and due to the COVID situation, the academic year 2019-2020 was not closed until November 2020. An additional call was opened for November 2020 to help

students enrolled in the "Master's Thesis" subject to complete their activities. In particular, two MEAiSE students defended their Master's thesis last November, and the corresponding marks were available on the 30th of November.

According to data from November 2020, the drop-out rate for year 2019-2020 is 6.25%, being the same value as the one already presented in the accreditation report.

Table B.6.14 Comparison of the fees predicted in the report with the fees actually paid

| DEGREE (Curriculum) | Indicator | Results forecast | 2017-18 | | 2018-19 | | 2019-20 | |
|---|---|---|---|---|---|---|---|---|
| | | | WOMEN | MEN | WOMEN | MEN | WOMEN | MEN |
| 2073- ENVIRONMENTAL ENGINEERING AND SUSTAINABLE ENERGY (2016) | Graduation rate (RD) | **90%** | - | - | 100.00% | 94.12% | 100,00% | 85,71% |
| | | | **-** | | **95.65%** | | **87.50%** | |
| | Drop-out rate (RD) | **6%** | - | - | 0.00% | 0.00% | 0,00% | 7,14% |
| | | | **-** | | **0.00%** | | **6.25%** | |
| | Efficiency rate (EA) | **90%** | 97.87% | 99.67% | 100.00% | 95.98% | 99.45% | 98.73% |
| | | | **99.15%** | | **96.49%** | | **98.82%** | |

Source: SINIA Reports ACRM09, ACRM11 and ACRM12 on 12 December 2020

Graduation rate: Calculation formula (Aneca): Graduates in "d" or in "d+1" (of those registered in "c") ---------- x100 Total number of students registered on a course "c"

Efficiency rate: Calculation formula (Aneca): Theoretical credits in the curriculum x Number of graduates ---------- x 100 Total number of credits graduates actually register for

Drop-out rate: Calculation formula (Aneca): No. of students not registered in the final year "t+1" ----------x100 No. of students registered in year t-n+1

(n = duration in years of the curriculum)

## Criterion 5.3 Relevant rules

*The auditors point out that only some information about the degree programmes is available in English on URV's homepage. Since both MEQ and MEAiSE are taught in English and have several international students, it is necessary to provide all relevant information about the degree programmes (e.g. study and exam regulations) in an English translation for all stakeholders (e.g. by publishing them on the webpage).*

The following regulations can already be found in English:

- Academic regulations for Bachelor's and Master's Degree studies
- Regulations for registration onto bachelor's and master's degree programmes
- Regulations governing mobility
- Regulations governing external internships by URV students

*As indicated above, we request the correction of this sentence.*

## REQUEST FOR CORRECTION OF FACTUAL ERRORS & AMENDMENTS

We ask that you consider correcting any typographical errors found in the report.

**Criterion 1.4 Curriculum**

**MEAiSE**

*"In 2018/19, 63 students pre-registered for MEAiSE, 41 were admitted and 28 registered. As in previous years, the number of enrolled students covered almost all offered places (30). MEAiSE is popular with international students who apply at several universities and sometimes have problems with their visa or face financial problems. Consequently, more students are accepted because several will not start with the programme. Considering the total number of students enrolled (first and second year), 45 % are international students.*

*As described in the Admission Regulation, MEQ is designed for "graduates in chemical engineering or in a similar field, or with a university degree that qualifies graduates to practice as professional technical industrial engineers specialized in industrial chemistry or a similar field"."*

We assumed that this incorrect value was a misprint and this number has been amended. Students from Spain account for 46%, and therefore 54% correspond to international student. Those were the figures presented in the self-assessment report, and they can be confirmed in the table below, with information obtained from Table B.1.7.

| | Country | Students registered | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2016-17 | | 2017-18 | | 2018-19 | | 2019-20 | |
| | | Num. | % | Num. | % | Num. | % | Num. | % |
| 2073-ENGINYERIA AMBIENTAL I SOSTENIBILITAT ENERGÈTICA (2016) | Others | | | | | | | 1 | 2,08% |
| | America | 3 | 13,04% | 6 | 15,38% | 4 | 9,09% | 4 | 8,33% |
| | Spain | 10 | 43,48% | 16 | 41,03% | 19 | 43,18% | 22 | 45,83% |
| | Oceania | | | | | | | 1 | 2,08% |
| | Europe | | | | | 1 | 2,27% | | |
| | European Union | 4 | 17,39% | 6 | 15,38% | 4 | 9,09% | 3 | 6,25% |
| | Africa | 4 | 17,39% | 5 | 12,82% | 7 | 15,91% | 6 | 12,50% |
| | Asia | 2 | 8,70% | 6 | 15,38% | 9 | 20,45% | 11 | 22,92% |

Source: SINIA Report ACRM03 on 19 January 2021.

*As indicated above, we request the correction of this value.*

**Criterion 2.2 Work load and credits**

*Based on the study plans, the statistical data, and the comments of the students, the auditors conclude that there is are obstacles to the quality of teaching and the level of education due to the workload.*

As was confirmed in the message of the 11th of December, the phrasing of the sentence is not correct and the appropriate version is:

Based on the study plans, the statistical data, and the comments of the students, the auditors conclude that there are no obstacles to the quality of teaching and the level of education due to the workload.

*As indicated above, we request the correction of this sentence.*

**Criterion 2.2 Work load and credits**

*The students also express their satisfaction with the library and the available literature there. However, they criticise that the opening hours, especially at the weekends and in the evenings, are limited. Therefore, the peers suggest that the opening hours could be prolonged during the examination periods so that students can better study and prepare for the exams.*

Due to the COVID restrictions (reduction of mobility, curfew, capacity reductions), during academic year 2020-2021 opening hours at CRAI have been reduced. However, before the pandemic, the CRAI at Campus Sescelades was open from 8 to 21h Monday to Friday and during the weekends the CRAI at Campus Catalunya (downtown Tarragona) was open on Saturdays from 9 to 21h.). During examination periods, opening hours at CRAI Catalunya were extended (8 to 24h Monday to Friday, 9 to 24h Saturday, 9 to 15h Sunday).

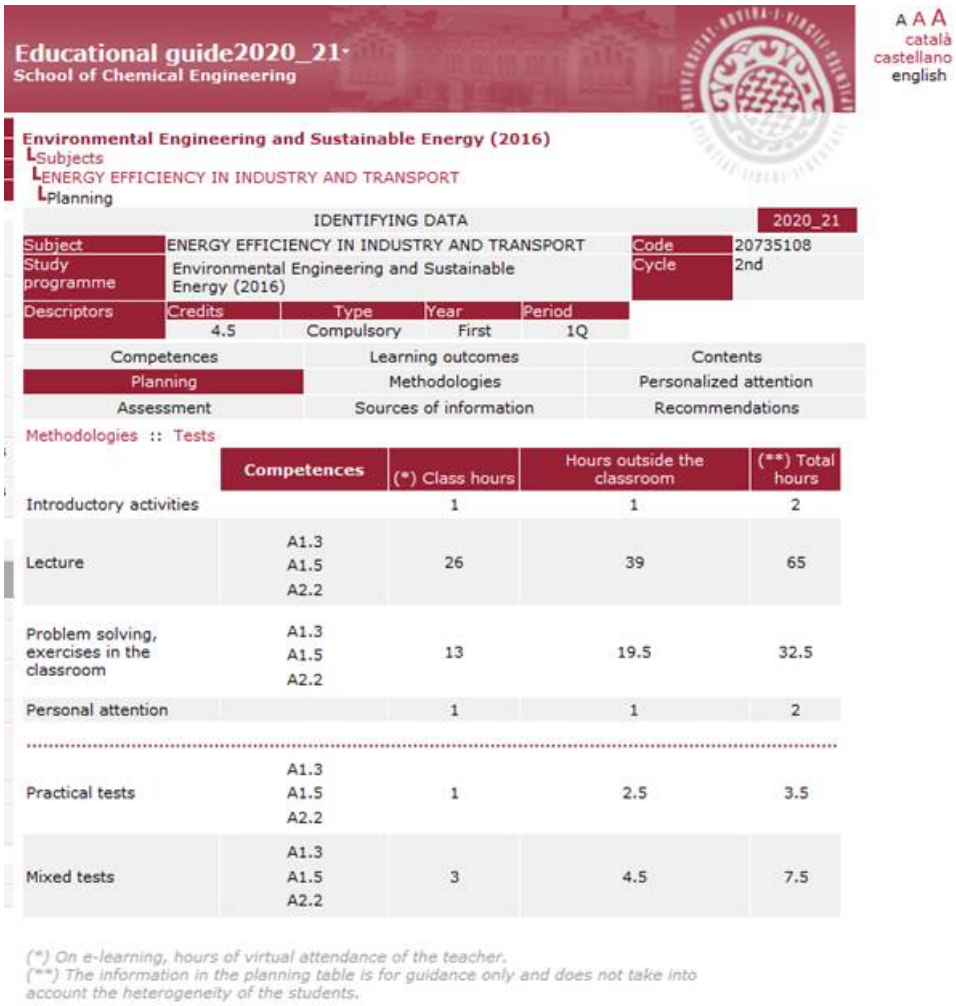
*In view of the above, we request that you review the text in the light of this information.*

**Criterion 2.2 Work load and credits and Criterion 5.1 Module descriptions**

*(…) The auditors confirm that the information about the workload in hours (including the distinction between classroom work and self-studies) is available to the students. However, the peers point out that this information should also be included in the module descriptions.*

*(…) However, the peers point out that the module descriptions do not include detailed information about the students' workload. This should be made up for*.

Information about the student's workload is provided in the Educational Guide for each subject in the planning section. In the Moodle space of each subject, there is a link to the corresponding Educational Guide.



Educational guide2020_21
School of Chemical Engineering

AAA català castellano english

Environmental Engineering and Sustainable Energy (2016)
Subjects
ENERGY EFFICIENCY IN INDUSTRY AND TRANSPORT
Planning

| IDENTIFYING DATA | | | | | 2020_21 |
|---|---|---|---|---|---|
| Subject | ENERGY EFFICIENCY IN INDUSTRY AND TRANSPORT | | | Code | 20735108 |
| Study programme | Environmental Engineering and Sustainable Energy (2016) | | | Cycle | 2nd |
| Descriptors | Credits | Type | Year | Period | |
| | 4.5 | Compulsory | First | 1Q | |

Competences | Learning outcomes | Contents
Planning | Methodologies | Personalized attention
Assessment | Sources of information | Recommendations

Methodologies :: Tests

| | Competences | (*) Class hours | Hours outside the classroom | (**) Total hours |
|---|---|---|---|---|
| Introductory activities | | 1 | 1 | 2 |
| Lecture | A1.3 A1.5 A2.2 | 26 | 39 | 65 |
| Problem solving, exercises in the classroom | A1.3 A1.5 A2.2 | 13 | 19.5 | 32.5 |
| Personal attention | | 1 | 1 | 2 |
| Practical tests | A1.3 A1.5 A2.2 | 1 | 2.5 | 3.5 |
| Mixed tests | A1.3 A1.5 A2.2 | 3 | 4.5 | 7.5 |

(*) On e-learning, hours of virtual attendance of the teacher.
(**) The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

*For the above reasons, we request that these sentences be revised.*

***Criterion 3 Exams: System, concept and organization***

*All courses, except for the Master's thesis and Work Placement, have two examination attempts (…)*

Since year 2019-2020, the Master's thesis also allows for two attempts.

*As indicated above, we request that the reference in the case of the Master's thesis be removed.*

**Criterion 6. Quality management: quality assessment and development**

*Unfortunately, the motivation of students to take up such an office is low, although they receive credits for participating in the university's panels.*

Students who receive credits for their participation in the different governing bodies are undergraduates. For Master's degree students, Spanish legislation does not provide for this type of recognition through credits.

*Due to the above, we request that the reference to the recognition of credits in the case of Master's students be removed.*

## Improvement Plan ETSEQ, MEAiSE & MEQ 2020-21

| Code | Scope | Stan. | Source of improvement | Weak points detected | Proposals for improvement | Action to be taken | Priority | By | Inform URV? | Deadline | Modify report | Monitoring Evidence /Indicator |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2020.21-ETSEQ-3.2-M1 | ETSEQ | E3.2 | Draft Accreditation Report ASIIN (Criterion 6) | Low rate of participation rate of students in satisfaction surveys | Give feedback to students about the survey results | Make publicly available in Moodle table C.1 that presents the % of participation in the different surveys and the average degree of satisfaction | Medium | TSQD and CM | No | 2020-21 | No | Table publicly available in Moodle |
| 2020.21-ETSEQ-3.2-M2 | ETSEQ | E3.2 | Draft Accreditation Report ASIIN (Criterion 6) | Low rate of participation rate of students in satisfaction surveys | Identify in the table with proposals for improvement those that have arisen from delegates, tutorial meetings, meetings with the teaching staff, or qualitative questions of the surveys. | Make publicly available in Moodle the table with proposals for improvement of the previous year identifying those that have arisen from the students. | Medium | TSQD and CM | No | 2020-21 | No | MoodleTable publicly available in Moodle |
| 2020.21-MEQ-1.2-M1 | MEQ | E1.2 | Draft Accreditation Report ASIIN (Criterion 1.3) | Only 3 electives are offered which turn out to be compulsory | To find electives of both MEAiSE to cover the energy area, and MGET to cover the management area. | Review the different curricula (and their timetables) to choose the subjects that best suit as electives for MEQ | Medium | CM | No | 2021-22 | Yes | To include 3 new electives into the currículum |

**E Comment of the Higher Education Institution (29.01.2021)**

| Code | Scope | Stan. | Source of improvement | Weak points detected | Proposals for improvement | Action to be taken | Priority | By | Inform URV? | Deadline | Modify report | Monitoring Evidence /Indicator |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2020.21-MEAiSE-1.2-M1 | MEAiSE | E1.2 | Draft Accreditation Report ASIIN (Criterion 1.3) | Students choosing the optional subject Management and Administration of Companies with 4.5 ECTS, exceed by 1.5 ECTS the number of credits required as electives | Assignments in the subject will be adapted to the students from the MEAISE master, and the workload will be equivalent to 3 ECTS, without affecting the intended learning outcomes. | Process an application for modification of the degree report. | Medium | CM | No | 2021-22 | Yes | Curriculum |
| 2020.21-MEAiSE-1.4-M1 | MEAiSE | E1.4 | Draft Accreditation Report ASIIN (Criterion 2.2) | Students comment that they have different deliveries at the same time | Collect the information of the different deliveries for all the subjects in each semester | The coordinator will ask all professors for information about tasks and due dates before starting each semester in order to identify possible peaks in the workload and if needed, ask professors for a rearrangement in the scheduling of the tasks. | Medium | CM | No | 2020-21 | No | Excel with tasks, workload and due dates |

**E Comment of the Higher Education Institution (29.01.2021)**

| Code | Scope | Stan. | Source of improvement | Weak points detected | Proposals for improvement | Action to be taken | Priority | By | Inform URV? | Deadline | Modify report | Monitoring Evidence /Indicator |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2020.21-ETSEQ-6.2-M1 | ETSEQ | E6.2 | Draft Accreditation Report ASIIN (Criterion 2.2) | The teaching guide does not return a warning if the credits multiplied x 25h | The new application (GUIDO) should incorporate an alarm that warns the teacher if they plan more or less hours than those corresponding to the credits of the subject. | Send the request to the GPQ for consideration. | Medium | GPQ | Yes | 2022-23 | No | Alarm in GUIDO, the new teaching guid application |

CM: Head of master's programme; CPAD: Head of Tutorial Action Plan; GPQ: Bureau for Programming and Quality; IA: Self-Assessment Report; Inf. PAT: Tutorial Action Plan Report; IST: Programme Monitoring report; RE: Head of Bachelor's programme; RSIGQ: Head of the internal quality assurance system; SREd: Educational Resources Service; SRI: Computer Service; Stan.: Standard; TSQD: Teaching Quality Support Officer; GR: Rector's Bureau; USGCD: Unit of Support to the Management of Faculties, Schools and Departments (ETSEQ-DEQ-DEM)

# F Summary: Peer recommendations (15.02.2021)

The peers recommend the award of the seals as follows:

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ma Chemical Engineering | With requirements for one year | EUR-ACE® | 30.09.2026 |
| Ma Environmental Engineering and Sustainable Energy | Without requirements | EUR-ACE® | 30.09.2026 |

## Requirements

**For the Master's degree programme Chemical Engineering**

A 1. (ASIIN 1.3) Offer electives of more than 9 ECTS so that the students have a choice and can follow their individual interests.

# G Comment of the Technical Committees (10.03.2021)

## Technical Committee 01 – Mechanical Engineering/Process Engineering (03.03.2021)

*Assessment and analysis for the award of the ASIIN seal:*

The Technical Committee discusses the procedure and proposes a change to the assessment of the peers. The members of the TC believe that it is not necessary to impose a requirement regarding the offer of electives. They assist that it lies within the freedom of the university to design the electives and the amount of credits, which they assign for electives, according to their choice. The TC 01 suggests changing the requirement into a recommendation.

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

The Technical Committee supports the award of the EUR-ACE® label.

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

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ma Chemical Engineering | With requirements for one year | EUR-ACE® | 30.09.2026 |
| Ma Environmental Engineering and Sustainable Energy | Without requirements | EUR-ACE® | 30.09.2026 |

## Technical Committee 05 – Physical Technologies, Materials and Processes (02.03.2021)

*Assessment and analysis for the award of the ASIIN seal:*

The Technical Committee discusses the procedure and agrees with the assessment of the peers.

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

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ma Chemical Engineering | With requirements for one year | EUR-ACE® | 30.09.2026 |
| Ma Environmental Engineering and Sustainable Energy | Without requirements | EUR-ACE® | 30.09.2026 |

# Technical Committee 09 – Chemistry (02.03.2021)

*Assessment and analysis for the award of the ASIIN seal:*

The procedure was carried out as an online procedure in cooperation with the Catalan agency AQU. Prof. Grotemeyer was involved as an expert on the chemistry side. The Master's programme in Chemical Engineering was previously accredited by the Spanish agency ANECA (EUR-ACE Label), the Master's programme in Environmental Engineering and Sustainable Energy has been offered since 2016/17; this is an initial accreditation. The points of criticism of the peers (better coordination of group work, information about the total workload of the students in the module descriptions, comparison of the workload of the students with the ECTS awarded and provision of all relevant information on the English websites) are taken up by the university in the follow-up to the audit and almost all deficiencies are eliminated. Therefore, the peers propose an accreditation with one requirement for the Master's programme Environmental Engineering and Sustainable Energy and without requirements for the Master's programme Chemical Engineering. The Technical Committee follows this assessment.

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

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ma Chemical Engineering | With requirements for one year | EUR-ACE® | 30.09.2026 |
| Ma Environmental Engineering and Sustainable Energy | Without requirements | EUR-ACE® | 30.09.2026 |

# H Decision of the Accreditation Commission (16.03.2021)

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

The Accreditation Commission discusses the procedure and agrees with the peers. The proposed requirement with respect to the electives is considered to be sensible and the conversion into a recommendation as suggested by FA 01 is not supported.

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

The Accreditation Commission supports the award of the EUR-ACE label.

The Accreditation Commission for Degree Programmes decides to award the following seals:

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ma Chemical Engineering | With requirements for one year | EUR-ACE® | 30.09.2026 |
| Ma Environmental Engineering and Sustainable Energy | Without requirements | EUR-ACE® | 30.09.2026 |

## Requirements

**For the Master's degree programme Chemical Engineering**

A 1. (ASIIN 1.3) Offer electives of more than 9 ECTS so that the students have a choice and can follow their individual interests.

# I Fulfillment of Requirements (18.03.2022)

## Analysis of the peers and the Technical Committees (09.03.2022)

### Requirements

**For the Master's degree programme Chemical Engineering**

A 1. (ASIIN 1.3) Offer electives of more than 9 ECTS so that the students have a choice and can follow their individual interests.

| **Initial Treatment** | |
|---|---|
| peers | fulfilled<br>Vote: unanimous<br>Justification: URV introduced three new electives for the Master's degree programme. So, the students now can choose 3 out of 6 electives and the total of credits increased from 9 to 19.5 ECTS. |
| TC 01 | fulfilled<br>Vote: unanimous<br>Justification: The TC agrees with the peer group. |
| TC 09 | fulfilled<br>Vote: unanimous<br>Justification: The TC follows the assessment of the peer group. |

## Decision of the Accreditation Commission (18.03.2022)

| Degree Programme | ASIIN-seal | Subject-specific label | Maximum duration of accreditation |
|---|---|---|---|
| Ma Chemical Engineering | All requirements fulfilled | EUR-ACE® | 30.09.2026 |

# Appendix: Programme Learning Outcomes and Curricula

According to the Self-Assessment Report, the following **objectives** and **learning outcomes (intended qualifications profile)** shall be achieved by the Master's degree programme Environmental Engineering and Sustainable Energy:

| Type A | Code | Competences Specific |
|---|---|---|
| | A1.1 | Demonstrate a thorough knowledge and understanding of the disciplines within in the ambit of environmental engineering and sustainable energy. |
| | A1.2 | Analyse the dynamic interactions in complex environmental systems. |
| | A1.3 | Provide scientific advice in the implementation of decisions and policies that are sustainable, environmentally friendly and foster energy saving and efficiency in accordance with the current legislation. |
| | A1.4 | Understand and apply tools and strategies for the management and/or design of processes and products in the ambit of environmental and energy sustainability. |
| | A1.5 | Formulate the strategies needed to collect data for the design and application of conceptual and calculation models in order to better understand complex systems in engineering and environmental and energy management. |
| | A2.1 | Understand and apply the latest and most innovative environmentally friendly technologies to solve problems in various areas. |
| | A2.2 | Analyse the energy installations and apply the latest and most innovative strategies for energy saving and performance enhancement. |
| | A2.3 | Manage complex technical or professional projects that may require knowledge from outside the discipline. |
| | A3.1 | Execution, presentation and defence before a university examination panel of an individually undertaken original project in the field of Environmental, Energy and Sustainable Engineering. The project should be a technical assignment reflecting the type of tasks carried out by a professional engineer or a research project in any of the aforementioned fields that synthesizes and applies the competencies acquired during the master's degree. |
| **Type B** | **Code** | **Competences Transversal** |
| | B1.1 | Communicate complex ideas effectively to all sorts of audiences. |
| | B1.2 | Adapt to change. Modify behaviour and working method in response to changing conditions. |
| | B2.1 | Lead and define multidisciplinary teams that can respond to technical changes and management needs in national and international contexts and in poorly defined situations. |
| | B2.2 | Provide purpose and direction. Influence and guide others to improve performance and achieve objectives. |
| | B2.3 | Create a suitable environment for personal development. |
| | B2.4 | Pool knowledge and recognise the difficulties inherent in making judgements and taking decisions on the basis of incomplete or limited information, especially when such decisions require reflection on the social and ethical responsibilities of professional practice |
| | B3.1 | Work in multidisciplinary teams and in complex contexts. |
| | B3.2 | Resolve conflicts constructively. |
| | B4.1 | Be able to learn autonomously in order to maintain and improve the personal competencies relating to continuous improvement acquired during the course. |
| | B4.2 | Develop abilities to manage their professional career. |
| | B5.1 | Develop sufficient autonomy to work in scientific, technological or cultural research projects and collaborations in the discipline |
| | B5.2 | Solve complex problems critically, creatively and innovatively in multidisciplinary contexts. |
| | B5.3 | Apply new technologies and advances with initiative and entrepreneurial spirit and manage and use information in an efficient manner. |
| | B6.1 | Apply ethical principles and social responsibility as a citizen and a professional. |

The following **curriculum** is presented:

| First Year | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Credits |
| 20735108 | ENERGY EFFICIENCY IN INDUSTRY AND TRANSPORT | 1Q | Compulsory | 4.5 |
| 20735105 | ENVIRONMENTAL AND ENERGY LEGISLATION | 1Q | Compulsory | 3 |
| 20735109 | ENVIRONMENTAL AND ENERGY MANAGEMENT | 1Q | Compulsory | 3 |
| 20735110 | MANAGEMENT AND VALORISATION OF WASTES | 1Q | Compulsory | 4.5 |
| 20735106 | RENEWABLE ENERGY TECHNOLOGIES | 1Q | Compulsory | 4.5 |
| 20735103 | SUSTAINABILITY TOOLS | 1Q | Compulsory | 4.5 |
| 20735111 | ADVANCED WATER TREATMENT | 2Q | Compulsory | 4.5 |
| 20735101 | ATMOSPHERE AND AIR POLLUTION | 2Q | Compulsory | 4.5 |
| 20735107 | ENERGY EFFICIENCY IN BUILDINGS | 2Q | Compulsory | 4.5 |
| 20735102 | ENVIRONMENTAL AND ENERGY ECONOMICS | 2Q | Compulsory | 3 |
| 20735104 | THERMAL AND HYDRAULIC MACHINES | 2Q | Compulsory | 4.5 |
| 20735112 | ECO-EFFICIENT PROCESS DESIGN | AN | Compulsory | 6 |

| Second Year | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Credits |
| 20735301 | MASTER'S THESIS | 1Q | Final master project | 18 |
| 20735401 | WORK PLACEMENT | 1Q | Compulsory work placement | 12 |

| Optional | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Credits |
| 20735216 | ADVANCED FLUID MECHANICS | 1Q | Optional | 3 |
| 20735202 | ANALYTICAL TOOLS APPLIED TO ENVIRONMENTAL ENGINEERING | 1Q | Optional | 3 |
| 20735212 | FUNDAMENTALS OF CHEMICAL ENGINEERING | 1Q | Optional | 3 |
| 20735204 | INDUSTRIAL LEADERSHIP | 1Q | Optional | 3 |
| 20735201 | MANAGEMENT AND ADMINISTRATION OF COMPANIES | 1Q | Optional | 4.5 |
| 20735215 | THERMAL ENGINEERING | 1Q | Optional | 3 |
| 20735214 | UNIT OPERATIONS | 1Q | Optional | 3 |
| 20735205 | CHANGE MANAGEMENT AND ORGANIZATIONAL INNOVATION | 2Q | Optional | 3 |
| 20735208 | EMERGING ENERGY TECHNOLOGIES | 2Q | Optional | 3 |
| 20735203 | INTEGRATION OF RENEWABLE ENERGIES | 2Q | Optional | 3 |
| 20735211 | KINETICS AND REACTOR DESIGN | 2Q | Optional | 3 |

| | | | | |
|---|---|---|---|---|
| 20735206 | MODELLING OF WASTEWATER TREATMENT PLANTS | 2Q | Optional | 3 |

| **Bridging courses** | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Credits |
| 20735603 | CF ADVANCED FLUID MECHANICS | 1Q | Basic Course | 3 |
| 20735602 | CF THERMAL ENGINEERING | 1Q | Basic Course | 3 |
| 20735212 | FUNDAMENTALS OF CHEMICAL ENGINEERING | 1Q | Optional | 3 |
| 20735215 | THERMAL ENGINEERING | 1Q | Optional | 3 |
| 20735211 | KINETICS AND REACTOR DESIGN | 2Q | Optional | 3 |

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

| Type A | Code | Competences Specific |
|---|---|---|
| | A1.1 | Effectively apply knowledge of basic, scientific and technological materials pertaining to engineering. |
| | A1.2 | Design, execute and analyse experiments related to engineering. |
| | A1.3 | Be able to analyse and synthesize the continuous progress of products, processes, systems and services, whilst applying criteria of safety, economic viability, quality and environmental management. (G6) |
| | A1.4 | Know how to establish and develop mathematical models by using the appropriate software in order to provide the scientific and technological basis for the design of new products, processes, systems and services and for the optimization of existing ones. (G5) |
| | A2.1 | Be able to apply the scientific method and the principles of engineering and economics to formulate and solve complex problems that arise in processes, equipment, installations and services, in which the material undergoes changes to its composition, state or energy content, these changes being characteristic of industrial chemistry and other related sectors such as pharmacology, biotechnology, materials sciences, energy, food and the environment. (G1) |
| | A2.2 | Conceive, project, calculate and design processes, equipment, industrial installations and services in the field of chemical engineering and related industrial sectors in terms of quality, safety, economics, the rational and efficient use of natural resources and the conservation of the environment. (G2) |
| | A2.3 | Lead and technically and economically manage projects, installations, plants, companies and technological centres in the ambit of chemical engineering and related industrial sectors. (G3) |
| | A3.1 | Apply knowledge of mathematics, physics, chemistry, biology and other natural sciences by means of study, experience, practice and critical reasoning in order to establish economically viable solutions for technical problems (I1). |
| | A3.2 | Design and optimize products, processes, systems and services for the chemical industry on the basis of various areas of chemical engineering, including processes, transport, separation operations, and chemical, nuclear, electrochemical and biochemical reactions engineering (I2). |
| | A3.3 | Conceptualize engineering models and apply innovative problems solving methods and appropriate IT applications to the design, simulation, optimization and control of processes and systems (I3). |
| | A3.4 | Be able to solve unfamiliar and ill-defined problems by taking into account all possible solutions and selecting the most innovative. (I4) |
| | A3.5 | Lead and supervise all types of installation, process, system and service in the different industrial areas related to chemical engineering (I5). |
| | A3.6 | Design, construct and implement methods, processes and installations for the integrated management of waste, solids, liquids and gases, whilst also taking into account the impacts and risks of these products (I6). |
| | A4.1 | Lead and organize companies and production and service systems by applying knowledge and abilities regarding industrial organization, commercial strategy, planning and logistics, mercantile and labour legislation, and financial and costs accounting (P1). |
| | A4.2 | Lead and manage the organization of work and human resources by applying criteria regarding industrial safety, quality management, occupation risk prevention, sustainability and environmental management (P2). |
| | A4.3 | Manage research, development and technological innovation whilst ensuring the transfer of technology and taking into account property and patent rights (P3). |
| | A4.4 | Adapt to structural changes in society caused by economic, energy or natural factors so as to be able to solve any resulting problems and to contribute technological solutions with a high commitment to sustainability (P4). |
| | A4.5 | Lead and monitor the control of installations, processes, products, certification, auditing, verification, testing and reports (P5). |
| | A4.6 | Knowing how to create a new business from an innovative idea |
| | A5.1 | Carry out, present and defend (once all the curriculum credits have been obtained) an original individually produced piece of work before a university panel. The work will consist of a professional integrated Chemical Engineering project that synthesizes (TFM1) |
| **Type B** | **Code** | **Competences Transversal** |

| | | |
|---|---|---|
| | B1.1 | Communicate and discuss proposals and conclusions in a clear and unambiguous manner in specialized and non-specialized multilingual forums (G9). |
| | B1.2 | Adapt to changes and be able to apply new and advanced technologies and other important developments with initiative and entrepreneurial spirit. (G10) |
| | B2.1 | Lead and define multidisciplinary teams that are able to make technical changes and address management needs in national and international contexts. (G8) |
| | B2.2 | Provide guidelines for the definition and achievement of objectives. |
| | B2.3 | Create a suitable environment for individual development. |
| | B2.4 | Bring together knowledge and face the complexity of making judgments and taking decisions, based on incomplete or limited information, which include reflections on the social and ethical responsibilities in the professional practice. |
| | B3.1 | Work in a team with responsibilities shared among multidisciplinary, multilingual and multicultural teams. |
| | B3.2 | Resolve conflicts constructively. |
| | B4.1 | Be able to learn autonomously in order to maintain and improve the competences pertaining to chemical engineering that enable continuous professional development. (G11). |
| | B4.2 | Develop abilities to manage their professional career. |
| | B5.1 | Carry out and lead the appropriate research, design and development of engineering solutions in new or little understood areas, whilst applying criteria of creativity, originality, innovation and technology transfer. (G4). |
| | B5.2 | Solving complex problems in a critical, logical and creative way, in multidisciplinary contexts. |
| | B5.3 | Apply new technologies and advances with initiative and entrepreneurial spirit and manage and use information in an efficient manner. |
| | B6.1 | Apply ethical principles and social responsibility as a citizen and a professional. |

The following **curriculum** is presented:

| First Year | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Cred-its |
| 20695102 | ADVANCED THERMODYNAMICS AND MOLECULAR SIMU-LATION | 1Q | Compulsory | 6 |
| 20695101 | ADVANCED TRANSPORT PHENOMENA | 1Q | Compulsory | 6 |
| 20695110 | INDUSTRIAL LEADERSHIP | 1Q | Compulsory | 3 |
| 20695108 | MANAGEMENT AND ADMINISTRATION OF COMPANIES | 1Q | Compulsory | 4.5 |
| 20695105 | PRODUCT AND PROCESS DESIGN I | 1Q | Compulsory | 4.5 |
| 20695107 | ADVANCED CONTROL | 2Q | Compulsory | 3 |
| 20695103 | ADVANCED SEPARATION PROCESSES | 2Q | Compulsory | 6 |
| 20695109 | AUDITING AND INDUSTRIAL CERTIFICATION | 2Q | Compulsory | 4.5 |
| 20695111 | MANAGING CHANGE | 2Q | Compulsory | 3 |
| 20695106 | PRODUCT AND PROCESS DESIGN II | 2Q | Compulsory | 4.5 |
| 20695104 | REACTOR ENGINEERING | 2Q | Compulsory | 6 |

| Second Year | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Cred-its |
| 20695301 | MASTER'S THESIS | 1Q | Final master project | 15 |
| 20695401 | WORK PLACEMENT | 1Q single exam | Compulsory work place-ment | 15 |

| Optional | | | | |
|---|---|---|---|---|
| Code | Name | Period | Type | Cred-its |
| 20695202 | MATERIALS AND NANOSTRUCTURES | 1Q | Optional | 3 |
| 20695201 | POLYMERS | 1Q | Optional | 3 |
| 20695203 | BIOMATERIALS | 2Q | Optional | 3 |