ASIIN Seal & EUR-ACE®

Accreditation Report

Degree Programme
Cursus Master en Ingénierie: Mécanique / CMI Mechanics

Provided by
Sorbonne University

17 September 2021

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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]
Cursus Master en Ingénierie: Mécanique	CMI Mechanics	ASIIN, EUR-ACE® Label	Figure	01
Date of the contract: 27.11.2019 **Submission of the final version of the self-assessment report:** 25.05.2020 **Date of the onsite visit:** 02.07.2020 **at: Sorbonne Université, Campus P&M Curie**				
Peer panel: Prof. Gaël Chevalier, Université de Franche-Comté Prof. Dr.-Ing. Otto Theodor Iancu, Hochschule Karlsruhe Dr. Christoph Hanisch, Previously Festo AG & Co. KG, Esslingen Baptiste Moeglen-Paget, CMI Student, Université de Franche-Comté				
Representative of the ASIIN headquarter: Raphaela Forst				
Responsible decision-making committee: Accreditation Commission for Degree Programmes				
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 10.12.2015 Subject-Specific Criteria of Technical Committee 01 –Mechanical Engineering/Process Engineering as of 09.12.2011				

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

[2] TC: Technical Committee for the following subject areas: TC 01 - Mechanical Engineering/Process Engineering

B Characteristics of the Degree Programme

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
Cursus Master en Ingénierie: Mécanique / CMI Mechanics	CMI Mechanical Engineering	Energy and Environment, Acoustics, Fluid Mechanics and Applications, Solid Mechanics: Materials and Structures, Computational Mechanics, Advanced Systems and Robotics	7	Full time and sandwich course	Yes, La Sapienza Rome, Politecnico Milan	10 Semester	360ECTS	95% - CMI1 S1 1-3 students - CMI1 S2 1-2 students - CMI2 S3

For the degree programme Cursus Master en Ingénierie: Mécanique / CMI Mechanics the institution has presented the following profile in the self-assessment report:

“The CMI Mechanics SU trains high-level specialists in mechanics for the transport, aeronautics, aerospace, naval, civil engineering, energy, environment or health industries. The training is designed to ensure a good mastery of the different facets of the engineering and research professions, in particular by developing the ability to conduct high-level projects, not only in their scientific aspects, but also in their human, technical and economic aspects.

Graduates are positioned on expert engineering missions in design, modelling, numerical simulation or testing with the mastering of specialisation in fluid mechanics, materials and structures, computational mechanics, acoustics, energy and environment and robotics. This expertise, open to innovation and multi-disciplinary, is sought after by the research and development departments of major industrial groups, public or private research organisations, as well as SMEs and start-ups.

The CMI Mechanics SU is organized around a common trunk over the first three years (CMI1, CMI2, CMI3). Specialisation begins in the 4th year (CMI4), (while maintaining a significant common core in semester S7) with a choice between six specialisations: Energy and Environment, Acoustics, Fluid Mechanics and Applications, Solid Mechanics: Materials and

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

Structures, Computational Mechanics, Advanced Systems and Robotics. In 5th year (CMI5), this specialisation is refined with a choice between several themes.

The CMI Mechanics is partly based on the courses of the first year of the Sorbonne University (integration cycle, L1), the Bachelor of Mechanics and the Masters of Mechanics and Automation, Robotics of Sorbonne University. At the end of their Bachelor (CMI3) and Master (CMI5) degrees, students obtain the national diplomas:

- Bachelor's Degree: Science, Technology and Health, with a specialisation in Mechanics
- Master's Degree: Science, Technology and Health, with a specialisation in Mechanics or Automatic and Robotic”

C Peer Report for the ASIIN Seal[4]

1. The Degree Programme: Concept, content & implementation

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

Evidence:

- Objective Module Matrices for the CMI programme
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
For the CMI Mechanics, the University of Sorbonne (SU) presents the overall programme objectives and learning outcomes in the self-assessment report (SAR). The objective-module-matrices match the learning objectives of Figure network[5] with the specific learning outcomes of the CMI Mechanics and the ASIIN subject-specific criteria (SSC). The matrices also detail the specific modules, which correspond to the intended learning outcomes. The peers appreciate the detailed overview and are satisfied that the intended learning outcomes match with the individual modules in the curriculum.

The Figure network has defined the following learning outcomes for CMI:

1. acquisition of fundamental and disciplinary knowledge necessary for the specialisation and in order to operate in a multidisciplinary context
2. development of the capacity to select and apply analytical methods and tools , and to critically interpret results

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

[5] The Figure network ("Formation à l'ingénierie par des Universités de Recherche", Reseau Figure) is an international network of universities that offer Master Courses in Engineering (CMI). The network members collaborated in establishing a training concept that is based on a coherent five-year programme, strong link with research and innovation in the curriculum, the relevance of graduate qualifications to the needs of companies and societies, the promotion of international openness and a culture of training quality (including an accreditation and monitoring process within the network). For more information see https://reseau-figure.fr/?lang=en

3. the identification, formulation and resolution of real problems whilst taking account of technical and non-technical constraints (security, environment, economic & ethical factors)
4. development and design of new products at the cutting edge of disciplinary knowledge and technological advances
5. identification, localisation and acquisition of data
6. conception and execution of experiments, interpretation and exploitation of experiment results
7. use of digital tools and realisation of simulations in order to lead studies and research possible solutions
8. application of industrial and respect of safety and usage guidelines
9. awareness of economical, organisational and managerial issues
10. management of projects and professional and technical activities
11. integration of professional and technical knowledge to enable informed judgement and decision-making
12. use of various methods for clear, unambiguous communication
13. operation in an international, individual or team context
14. life-long training.

According to the Self-Assessment Report, the CMI Mechanics enables students to

- to master the fundamental concepts and principles of mechanic;
- to master numerical simulation methods in mechanics;
- to master the engineer's numerical tools
- to apply a rigorous scientific approach;
- to communicate orally as well as in writing, in French as well as in English;
- to be autonomous in learning, to ensure a technological watch and to conduct research;
- to manage a project and work in a team, implementing technological solutions;
- to master scientific computing, simulation and data processing tools;
- to master the job search process in companies and research laboratories.

The detailed learning outcomes for the CMI Mechanics (see also appendix for an overview) are split into the three categories “disciplinary and scientific fundamentals”, “disciplinary advanced” for each of the six master specializations, and “transferable and pre-professional”. The last category corresponds to the “social, economic and cultural openness” (SECO) learning objectives by Figure and includes communicative skills and skills regarding

personal development and understanding professional environment. The other two categories are also based on the common Figure learning outcomes, but individualized for the CMI Mechanics.

The Figure network has defined the following learning outcomes for CMI:

1. acquisition of fundamental and disciplinary knowledge necessary for the specialisation and in order to operate in a multidisciplinary context
2. development of the capacity to select and apply analytical methods and tools , and to critically interpret results
3. the identification, formulation and resolution of real problems whilst taking account of technical and non-technical constraints (security, environment, economic & ethical factors)
4. development and design of new products at the cutting edge of disciplinary knowledge and technological advances
5. identification, localisation and acquisition of data
6. conception and execution of experiments, interpretation and exploitation of experiment results
7. use of digital tools and realisation of simulations in order to lead studies and research possible solutions
8. application of industrial and respect of safety and usage guidelines
9. awareness of economical, organisational and managerial issues
10. management of projects and professional and technical activities
11. integration of professional and technical knowledge to enable informed judgement and decision-making
12. use of various methods for clear, unambiguous communication
13. operation in an international, individual or team context
14. life-long training.

The peers analyse the described learning outcomes and agree that they are consistent with the expectations of the European Qualification Framework Level 7 (equivalent to a Master's degree programme) as well as the respective Subject-Specific Criteria of the ASIIN Technical Committee 01 –Mechanical Engineering/Process Engineering. Furthermore, they comply with the standards and criteria of the EUR-ACE Label. It should also be noted that the learning outcomes detailed by Figure align with the ENAEE learning objectives for the EUR-ACE label.

For example, the general CMI objectives 2 and 3 correspond to the EUR-ACE objective for Engineering Analysis:

- "ability to analyse new and complex engineering products, processes and systems within broader or multidisciplinary contexts; to select and apply the most appropriate and relevant methods from established analytical, computational and experimental methods or new and innovative methods; to critically interpret the outcomes of such analyses;
- ability to conceptualise engineering products, processes and systems;
- ability to identify, formulate and solve unfamiliar complex engineering problems that are incompletely defined, have competing specifications, may involve considerations from outside their field of study and non-technical – societal, health and safety, environmental, economic and industrial – constraints; to select and apply the most appropriate and relevant methods from established analytical, computational and experimental methods or new and innovative methods in problem solving;
- ability to identify, formulate and solve complex problems in new and emerging areas of their specialisation";

while the general CMI objectives 12 and 13 correspond to the EUR-ACE objective of Communication and Team-working:

- "ability to use diverse methods to communicate clearly and unambiguously their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences in national and international contexts;
- ability to function effectively in national and international contexts, as a member or leader of a team, that may be composed of different disciplines and levels, and that may use virtual communication tools".

Based on the discussions with programme managers, industry partners, and alumni during the on-site visit, the peers conclude that the intended qualification profile allows the graduates to work as engineers, alone or in a team. It also prepares them for a PhD, which some graduates pursue in cooperation with the industry ("thèse cifre"). A recent graduate survey by the university shows that the majority of the graduates work as engineers and that they mainly hold R&D or R&D adjacent positions in big companies.

Industry partners and alumni are involved in the development of the study programme and the intended learning outcomes (see criterion 6).

The descriptions of the learning outcomes are clear and concise and are accessible to students and teachers via the university website. The peers point out that the learning outcomes or a summary should also be anchored in the diploma supplement in order to provide graduates with an official short presentation of their respective degree programme to facilitate applying for career opportunities worldwide. The peers notice that a diploma supplement has not yet been implemented (cf. criterion 5.2) and ask to establish this as soon as possible and to include a description of the qualification objectives.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
The degree programme is mainly taught in French, which is reflected in the official name of the study programme “Cursus Master en Ingénierie: Mécanique”.

The programme managers point out that the CMI is a specific national model for an engineering training course at a university, irrespective of the field of engineering. A CMI is based on a five-year curriculum (Bachelor plus Master degree) and the programme is evaluated and accredited by the Figure network. It is characterized by a balance between the disciplinary studies and soft skills, the support of high-level research laboratories and involvement of researchers throughout the curriculum, mandatory projects internships in industry and research laboratories, as well as at least one period of international mobility.

If students fulfil all requirements set by Figure, they are awarded the CMI label in addition to the national bachelor's and master's degrees. During the visit, the peers discuss if “integrated Master” would be a better descriptor of the course structure. However, they understand that the CMI is by now an established “brand” and nationally accepted label.

At the University of Sorbonne, the CMI Mechanics is based on the consecutive Bachelor and Master Mechanics, which includes six specializations in the field of mechanics. The programme managers thus decided to follow the history of that name and use the name “Méchanique” for the CMI as well. The peers agree with this reasoning.

The peers conclude that degree programme name reflects the intended aims and learning outcomes as well as the main course language.

Criterion 1.3 Curriculum

Evidence:

- Objective- module-matrices for the CMI programme
- Study plan for the CMI programme
- Module descriptions for the CMI programme
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
The peers review the curriculum of the CMI Mechanics in order to identify whether the available modules are able to achieve the described qualification objectives. They take into consideration the study plan, objective-module-matrices, and the individual module descriptions.

As the university explains in the Self-Assessment Report, a "CMI (Master degree in engineering) is a selective curriculum characterized by:

- continuity and coherence over five years, built on reinforced bachelor's and master's curricula;
- a balance between the disciplinary base and specialization, on the one hand, and the fundamental disciplines, scientific complements and social, economic and cultural openness (SECO), on the other hand;
- a co-responsibility by research laboratories of international level whose researchers participate in the training throughout the curriculum;
- a pedagogy of experience involving numerous situation-setting activities, internships in laboratories and companies and at least one period of international mobility."

CMI programmes are based on consecutive Bachelor and Master programmes and share teaching units with these programmes. The CMI curricula usually include more mandatory internships and windows for mobility. Due to the additional classes, mainly in the field of SECO (personal development, project management and economics), CMI students validate 36 ECTS per semester. Students have to validate each CMI year, i.e. pass the regular and CMI modules, in order to obtain the CMI. The non validation of a CMI year does not prevent the possibility of validating the year of the support diploma on which the CMI is based. This means that students could obtain the Bachelor and Master degree even if they fail to obtain the CMI label.

At the University of Sorbonne, the CMI Mechanics is partly based on the Bachelor and Master programmes Mechanics. In addition to these classes, students have six additional ECTS per semester in the field of "Social, economic and cultural openness". These are intended to enable the students to "develop autonomy, cooperative behaviour and understanding of the environments necessary for professional life".

The curriculum is structured as follows (for a more detailed overview see annex): Students follow a common curriculum for the first three years (Bachelor, CMI 1-3), before specialising in the fourth and fifth year (Master, CMI 4-5). They can choose among six specialisations offered in the underlying Master programme: Energy and Environment, Acoustics, Fluid

Mechanics and Applications, Solid Mechanics: Materials and Structures, Computational Mechanics as well as Advanced Systems and Robotics. Within the specialisation, they can further specialize in their final year.

The fundamentals of mathematics, physics, programming and later the specialization are taught in the first five semesters and at the beginning of the Master. This is complemented by courses in electronic and electrical engineering, mainly taught in the first three years and applied in different engineering projects throughout the study programme. Apart from these subject-related courses, the curriculum encompasses the additional SECO classes, as well as the four mandatory internships in industry and/or research laboratories and engineering projects (from second semester onwards). The regular English classes prepare the students for the international mobility in the sixth semester and the TOEIC certification (English language skills) at the end of their studies.

The study plan is published on the university website and accessible to the public. The peers are of the opinion that the objective-module-matrices transparently match the intended learning outcomes of the CMI to the individual modules. The module descriptions, also accessible via the website, contain the learning objectives for each module, which support the achievement of the overall learning objectives.

During the on-site visit, the peers discuss how the intended multidisciplinary focus is realised within the programme if the 16 graduates of each year are split between the six specialisations offered. The programme managers explain that the specialisations are offered for all master students, not just CMI. The curriculum gives all students a solid background in the field of mechanical engineering through the common core courses; they attain the multidisciplinarity through the projects offered (within the CMI curriculum) and the modules they choose within their specialisations. The research laboratories (see also criterion 4.3) follow a multidisciplinary approach as well and involve the CMI students through the different teaching units and possible internships and projects. The peers can follow this reasoning.

The peers then inquire after the career guidance offered to the students. The programme managers explain that this is an offer for all students from the faculty and prepares students for their search for internships. It also encompasses training in Latex, which is used for the internship reports. The teachers responsible for the different specialities and HR personnel from large companies give advice on the students' CV and cover letter as well as training for applications and job interviews. The students state that they benefit from this mandatory training and that they have no difficulties finding internships.

Regarding the language certification required to attain the CMI label, the HEI representatives clarifies that language certification is also required by the industry and that the University of Sorbonne enables its students to take the certifications. However, the curriculum and the language classes teach the students to speak und utilize their language skills, not just to test well for the certification. During the discussion with the students, the peers are impressed by the fluency of all CMI students.

From the self-assessment report and the discussions during the onsite visit, the peers gather that the stakeholders, notably students and industry partners, are included in the development of the curriculum and adjustments are made based on their feedback. The peers note that the processes for their involvement are well-established, but not yet documented (see criterion 6). They thus ask the HEI to document the involvement of stakeholders in the development of the CMI. From the discussions, the peers observe that students, alumni and industry partners are very satisfied with the curriculum and there is a high level of identification on the part of the students and alumni.

The peers assess that the curriculum, detailed in the annex of this accreditation report, is well founded and the syllabus one of the best in France, and thus well prepares students for national and international occupations. It also allows the students to reach the intended learning outcomes and to obtain the CMI label. The mandatory projects, internships and mobility opportunities, as well as the master specialisations allow the students to build an individual profile. The peers are especially impressed by the integrated internships, which allow students to gain experience in the industry but also in research. Graduates have great opportunities in the industry, but are also well prepared for a PhD, which they can do in cooperation with the industry. The peers also note the strong support of the programme by the teaching staff and the participating laboratories (criterion 4), which in their opinion is one of the main contributing factors to the success of the CMI.

Criterion 1.4 Admission requirements

Evidence:

- Admission process
- Admission requirements
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:

From the information provided and the audit discussions, the peers understand that admission to the CMI is based on the academic profile of high-school students (grades in

maths, physics, French, English; ranking of the student) and a 20-minute interview. Candidates apply via the national platform “Parcoursup”; selected candidates are invited to the interview. Foreign students are treated on a case-by-case basis and the interview is conducted by videoconference. The interview is used to assess the motivation of the students and to ensure they understand the expectations and the specificities of the CMI programme. The admission requirements are clearly detailed on ParcourSup, the French platform for university applications.

The university looks for applicants with a scientific baccalaureate (with good or very good marks), English skills that allow the international mobility in the third year of the CMI, open-mindedness (as denoted by the grades in French, history) and their general interests (association, sports, music). On average, around 27 students are admitted to the CMI per year. Maximum admission is 32, which is the capacity for practical exercises (travaux dirigées).

Admissions to the CMI for the second semester (around 2-3 students per year) or the beginning of the second year of the CMI (around 3-4) are subject to the same procedure of assessment based on the student file and an interview. Students will hand in transcripts of their previous studies, a CV and letter of motivation. Additionally, Figure regulations allows CMI students to switch between different CMI programmes.

Admission to CMI after bachelor level is possible for students holding foreign diplomas and students holding a non- CMI bachelor's degree. These students are subject to a training course consistent with the CMI’s requirements, making up the additional classes required by the CMI and continue their studies at master level (CMI4).

Around 10 % of the admitted students are from countries other than France. Additionally, there is usually one elite athlete (national and international level and ranking) per year accepted into the programme, as well as students coming from different fields of studies. Dropout rates remain very low. The programme managers explain that these happen mainly in the first two years as students re-orient themselves. It should also be noted that the CMI is visible and attractive to female students and that the ratio female:male has increased over the past years to currently around 50/50. This is not the case for the underlying Bachelor and Master programmes.

The focus on motivation leads to committed students and the peers notice during the discussions that students and graduates are clearly passionate about the CMI and their chosen field. Consequently, the peers judge the admission process to be transparent and adequate for selecting the best students for the degree programme. It should be noted that all graduates attain the CMI label at the end of their studies.

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

The University of Sorbonne does not comment on this criterion.

The peers regard criterion 1 as fulfilled.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules

Evidence:

- Study plan for the degree programme
- Module descriptions for the degree programme
- Information about double degrees and mobility partnerships
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:

Modularization

The degree programme is divided into modules, which comprise a sum of teaching and learning units. Modules usually consist of a combination of lectures, tutorials, discussion sessions, practical work (lab work, workshops), projects and or/internships. The learning/teaching methodology as well as the learning objectives are detailed in the module descriptions. The peers judge the structure of the modules to be adequate and fitting. The contribution of each module to reach the qualification level and the overall intended learning outcomes is explained clearly and is comprehensive.

All internships are integrated into the curriculum and through the obligatory report and defense; the HEI also monitors the quality of the internships in terms of relevance, content and structure.

Although CMI students follow a common study plan with mandatory international mobility and internships, they can freely choose one of the six specialties for their master and within their chosen specialty, different thematics are offered. The choice of specialty and modules within, as well as the choice of where to apply for internship and international mobility allows for an individual study pathway.

During the on-site visit, the peers inquire what would happen if there were changes in the modules of the underlying Bachelor and Master degree. The programme managers explain that this is only a theoretical question as they are responsible also for the Bachelor and Master programme and the same teaching staff is involved in all programmes. Developments in any of the curricula are discussed among the staff and decided on jointly.

The peers also ask after the "sandwich course", which is offered in addition to the full-time studies. According to the programme managers, students have the possibility to follow the CMI while also doing an apprenticeship in the industry ("formation en alternance"). Although a few students in the regular master programme follow such an apprenticeship, no CMI students have applied for this "sandwich course" option so far.It should also be noted that these students are expected to complete their studies in the same time as their non-apprenticed counterparts. This would be feasible through the integrated internships, which would be spent at the employer.

With the self-assessment report, the HEI also submits statistical data that show the low dropout rates and very successful graduation rates. Overall, the peers conclude that the curriculum is structured in a way to allow students to complete the degree without exceeding the regular course duration (see also criterion 3).

International Mobility

The curriculum includes a mandatory international mobility in the sixth semester at one of the partner universities of the University of Sorbonne; students are encouraged to go abroad during semesters eight and ten at the master level as well. The university choose to implement the mandatory mobility early in the curriculum to make the study programme more attractive to students. This also allows students to choose master level classes if bachelor's level classes are only offered in the local language. Students are supposed to follow classes that prepare them for the common core scientific classes of the fourth year. In individual cases and after consultation with the programme managers to assess whether the classes are consistent with the curriculum, a longer mobility period (one year) or a sabbatical/gap year is possible. Students always have the opportunity to extend the first mobility window with projects at either university or a company or to attend summer courses.

There is an second window of mobility during the master, as students can spend a semester at partner universities offering courses for their chosen specialization. Additionally, students can carry out their master level internships abroad.

The specialization "Computational Mechanics" also offers a double degree with one of two Italian universities. CMI Students can apply for this alongside regular master students and, if selected, will spend some time at either La Sapienza in Rome or the Politecnico di Milano.

The courses of the double degree are recognized for the national master and the CMI programme. CMI Students that successfully graduate will receive the double degree as well as the CMI label. International Students receive only the double degree. There are scholarships for all students enrolled in the double degree.

From the self-assessment report and the discussions during the on-site visit, the peers understand that there is a designated contact person who coordinates international mobility and that there are rules for recognising achievements and competences acquired outside the higher education institution. The many partner universities from University of Sorbonne, the contacts established by the Figure network and the research contacts from the teaching staff allow many opportunities to go abroad. There are also cooperation agreements for internships. Before each mobility (studying or internship), a learning agreement is established. Depending on the semester structure abroad, some students validate classes in Sorbonne before going abroad.

In regular meetings, students are informed about the possible destinations and mobility windows, as well as the application and recognition procedures. Within the CMI, students start planning their mobility at the beginning of the second year and are usually selected for their first or second wish regarding the destination. Students can apply for scholarships by the French government, social fund by the University of Sorbonne, the region, or the Mechanics department.

During the discussions, the students disclose that the mobility was a big draw for their decision to follow the CMI and the industry partners stress that the soft skills and language skills gained from the frequent stays abroad make the graduates very interesting and attractive for prospective employers. The peers concur and see the early mobility as well as the many additional opportunities for mobility as a big asset of the curriculum.

Criterion 2.2 Work load and credits

Evidence:

- Study plan for the degree programme
- Module descriptions for the degree programme
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
All modules of the programme are assigned ECTS credits. One semester comprises 36 credit points with each credit point amounting to 25 working hours that include both attendance-based learning and self-studies. The ratio between attendance-based learning and self-

study is detailed in the module descriptions. The module structure corresponds to the standards of the EQF, ASIIN and EUR-ACE®.

The peers acknowledge that all parts of the curriculum, including the mandatory internships, are awarded credit points, leading to 360 ECTS being awarded for the CMI programme. The rules governing the awarding of credits are accessible via the university website.

Based on the feedback from the students, the ECTS and workload of individual modules are adapted. During the discussions, the peers learn that the students are generally content with their workload and believe the awarded credits to reflect the workload adequately. While the first year is seen as the most difficult due to the adaption process to studying at the university, the students find the workload overall well-balanced. They feel also well-informed about the requirements necessary to obtain the CMI-label and the workload associated with the curriculum. While the peers agree with the students' assessment and find the workload of the curriculum generally to be suitable and manageable, they note that for "classical" teaching units of face-to-face teaching the workload includes 10 hours of attendance-based learning and 10 hours of self-study per ECTS. They also notice that in other courses and especially the projects, students will work more than the required 25 hours per ECTS. The peers therefore ask the HEI for a calculation of the average workload of the projects and internships, in order to clarify the relation between ECTS and student working hours.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
The CMI programme utilizes different educational methods for teaching the courses, such as lectures, application courses, practical works (workshops/ laboratory work), internships, projects and self-study. As part of the CMI requirements, the "situation-setting activities" like projects and internships amount to almost a quarter of the curriculum. During the Covid-19 pandemic, the university switched to distance learning. The module descriptions inform about the teaching methods of each module.

Through the laboratory internship and projects, students are directly involved with academic research. As most of the staff also belongs to one of the research labs that support the CMI, there is a strong connection between research and education.

A particularity of this CMI is the involvement of library staff in the curriculum and different projects. In a class on academic writing, students learn how to search for sources and write a paper. In a "carnet de labo" (laboratory book), students have to write 1-2 pages about their lab work and assess their results. Additionally, students focus on one reference and explain why this reference is relevant to their lab work. In the projects, the librarians evaluate the work of the students (bibliography, search for sources), which is part of the overall grade for the module. The peers agree with the programme managers that this approach teaches students how to do academic research and gives them continuous feedback on their academic work.

In summary, the peers acknowledge that within the CMI a variety of teaching methodologies is used that support the students in achieving the intended learning outcomes through both attendance-based learning and self-study. Students are consistently familiarised with academic research and writing.

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
During the on-site discussions with the programme coordinators, the teachers and especially the students, the peers gather a comprehensive impression of the offers related to supporting and assisting the students.

The University of Sorbonne offers social assistance, health services, career guidance, language and sport courses. Students also benefit from an active student life and the international partnerships established by the university. As noted in 2.1, students can apply for mobility grants from different sources. For CMI students, the company Safran offers a five-year-scholarship each year. The department of Mechanics also sometimes provide material aid such as laptop loans for students in financial difficulty.

Several options for pedagogical support have been implemented. A retired Mechanics Professor offers two hours per week of tutoring in mathematics, physics and mechanics (open to CMI- and non-CMI-students). Further tutoring in these subjects is offered for second- and third-year students. Within the CMI, each first-year student is assigned a mentor from the second year of the CMI. The CMI association also manages a tutoring and volunteering service across the different CMI years. During the discussions, the students explain that the mentoring system starts during the summer before the start of the first semester and is

very helpful to get started at the university. Due to the small group size, students of the same year ("promotion") know each other. The CMI association of the university organizes several meetings so that CMI students in different years get to know each other, and there is a national association that organizes events for all CMI programmes in France. The newly established alumni association also connects currents CMI students and graduates.

The students are thus well-connected and, as the peers learn, very active in promoting the CMI programme, tutoring each other or answering questions regarding previous mobility and internships. The students confirm that they are very satisfied with the support and assistance they receive and that they can contact their professors at any time if problems occur. They especially praise the good relationship with the programme managers.

Regarding internship, the students point out that finding a place for the first-year internship was difficult, because this type of internship is not common in France. By now, it is easier as the CMI is better known and has established contacts with several firms. Other internships in the industry or research laboratories are easier to find and if people do not manage on their own, the programme managers assist in the search.

As one of the research laboratories is based in a different location, the peers ask the students if this affects their studies. The students explain that they mostly do practical work on campus in Saint-Cyr. If they have classes on the other campus, they will only have the lab class and thus do not have to transfer throughout the day. Due to the travel time, classes also start later than on the main campus. As the schedule is well-organized, it does not impact their studies negatively.

Overall, the peers are very satisfied with the support and assistance the students receive.

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

In their statement, the HEI presents a detailed calculation of the student workload per ECTS. After taking into account minor corrections regarding the workload of internships and projects, the university concludes that the overall workload for the study programme is between 22,8 and 25,6 hours per ECTS, which corresponds to a mean value of 24,2 h/ECTS. The module descriptions for internships and projects will be modified accordingly so that they show the correct workload.

The peers thank the university for the updated workload calculation. They find the amended workload to be realistic and suitable to reach the intended learning outcomes.

Overall, the peers regard this criterion as fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Official documents outlining the examination process
- Exams calendar
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
The peers analyse the provided documents and notice that all modules of the CMI programme is examined. Examination types include Written exams, time-limited lab exams (practical exercises), continuous controls, quizzes, work reports, report and defense of projects and internships, oral presentations, poster presentations, bibliographic synthesis, other models of evaluations e.g. for team work exercises. Module descriptions mention the form of the exams; the weighting and evaluation modalities are communicated to students at the beginning of the semester. All relevant rules and regulations regarding the exam procedure are anchored and published on the university website. There are university guidelines and support services for handicapped students.

The academic calendar including the examination period of the academic year is communicated in September. Students are informed about exam dates at least 15 days before the exam and there is usually a revision week with free tutorials and tutoring session before the examination period. The deadline for reports and date of oral presentations are usually before the exams.

As it is usual in France, the CMI uses a system of continuous monitoring (tests and midterms during the semester) and a final examination at the end of each semester. At the University of Sorbonne, a final examination is mandatory for all modules. All internships finish with a report and defense and are assessed by at least one academic supervisor. Learning agreement cover externally acquired credits. The peers note that each report also includes a self-assessment by the student about the skills they acquired during the internship or a problem they encountered, how they dealt with it and how they would adapt their approach in the future. While not a typical part of an academic work, the peers agree with the programme managers that this teaches the students to evaluate themselves and makes them aware of the soft skills they acquired.

In order to pass a module, students must obtain an overall average score of at least 10/20. This takes into account the continuous assessment and the final exam of all courses/workshops in a module. Students with a lower score have to repeat the final assessment. The second session for exams (resits) are organized university-wide and are usually next semester or two weeks after the results were published. Other classes can compensate a failing grade, if the overall average in the different curriculum components (fundamentals, scientific courses, SECO, ..) is at least 10/20.

Based on the student statistics and discussion with the students the peers are convinced that it is possible to complete studies on time. The students feel well-informed and that the amount of exams is manageable. They see the continuous assessment as a way to get feedback and a form of exam preparation. For the continuous assessment, the correct answers are published on Moodle. In case of practical reports, students will receive corrections and have to send back the corrected version. Teachers also provide feedback on exams if the students ask for it.

During the discussions, the peers ask whether students have to prepare a Master thesis. The programme managers point out the mandatory internship in the last Master semester (6 months; projet fin d'etude) which includes a report of about 50 pages and successful validation is required to obtain the master degree. After successfully completing the first semester of the final master year, students are allowed to begin their master thesis. Students can choose an internship in the industry or a research laboratory. The subject is agreed upon with the academic supervisor and students prepare the thesis during and after the six month of the internship. They then defend the thesis in front of a committee, which consists of the academic supervisor, the internship supervisor from either industry or the research lab and additional teaching staff. All other mandatory internships also encompass a report and defense session of the report. The peers conclude from the discussions and the exemplary theses they assessed during the on-site visit that the final internship and the reports fulfil the ASIIN criteria for a final project.

The peers ask what would happen if students do not fulfil the requirements for the CMI label, i.e. validated bachelor and master degree, additional ECTS, mobility and internships, English certification. The programme managers explain that if a student would not meet the requirements, they would not be awarded the CMI label. For this, there is no possibility of a re-sit. However, so far, all students that finished their Master degree also obtained the CMI label. The internships and mobility is well established in the curriculum and students are well prepared for the English certification by the mandatory English classes, the mobility (most often to English speaking countries) and the master classes in English.

The peers also inspect a sample of exams, internship reports and project works and are overall satisfied with the general quality of the samples. They confirm that they hold an academic level comparable to the level aimed for and that the master thesis/final internship reports correspond to level 7 of the European Qualification Framework (EQF).

In summary, the peers acknowledge that the system, conception and organization of examinations employed in the CMI is efficient.

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

The University of Sorbonne does not comment on this criterion.

The peers regard criterion 3 as fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Handbook of Academic Staff
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
In the self-assessment report, the university presents data about the number and overall qualification of staff for the CMI Mechanics and during the discussion on site the peers gain a good impression of the quality of the teaching personnel.

In total, the teaching staff is composed of 20 professors, 33 associate professors, 24 part-time lecturers, 15 researchers, 4 teachers. Most members of the teaching staff belong to the Faculty of Science and Engineering at Sorbonne University, especially the department for Mechanics. The CMI is further supported by teacher-researchers from the departments of Computer Science, Mathematics, Electronics, and English. Visiting lecturers from the industry are involved in various courses such as project management and subject-specific classes in the master specializations.

As required by Figure for all CMI programmes, the CMI Mechanics at the University of Sorbonne is supported by two research laboratories (see 4.3) pursuing international research. Based on the self-assessment report, the discussions and visit to the laboratories, the peers conclude that the research activities of the staff support the curriculum very well. It should

be noted positively that students are in contact with the research laboratories and the research done by their teacher from early on (see 1.3).

During the discussions, the peers learn that the recruiting of new teaching staff follows the national process and requirements. As one of the programme coordinators will retire within the next few months, the peers ask how the next generation is prepared for taking over the responsibility for this programme. They learn that the current programme coordinators have established the CMI and are one of the main reasons for its success, as they are well connected with all stakeholders and very active. Over time, other staff members became involved and the programme is well-established and the responsibilities will be taken over by other staff members. Nevertheless, the peers would like a more detail overview of how the continuity of the programme management will be ensured.

During the discussions, the peers notice that the staff members, especially the core faculty, are very motivated and convinced of the offered study programme.

The peers conclude that the teaching staff is well qualified and quantitatively sufficient in order to sustain the programme under review. However, the teaching staff also cover the regular Bachelor and Master in Mechanics. During the discussion with the teachers, they explain that due to the high employment rates in Mechanical Engineering many students enrol in these programmes which leads to a higher workload as regards the preparation of classes and the support and examination of students. The peers see that the university is aware of this and considers this for their staff planning. However, the faculty should continue to monitor the situation and if necessary take steps to balance the workload of the teaching staff.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
The peers understand from the self-assessment report and the audit discussions that staff can use the faculty service “Centre d'accompagnement pour la pédagogie et support à l'expérimentation” (called Capsule) for their didactical training. Capsule aims to provide training on pedagogical engineering, video production, system administration, software engineering, reception and logistics. It also allows teachers to share their experiences and pedagogical innovations. Additionally, the staff can participate in the training courses by the Figure Network, e.g. for active pedagogy.

Participating in pedagogical training is mandatory for new assistant professors, which benefit from a reduced teaching load in the first year at the university. For all other staff, it is voluntary and teachers are encouraged, and often decide, to follow different training activities. While a sabbatical would be possible, staff members currently do not apply for sabbaticals as the high workload means the additional teaching hours are difficult to compensate within the pedagogical team. The peers see that this is a recent development, but should like to see more sabbaticals being possible in the future.

Criterion 4.3 Funds and equipment

Evidence:

- Partnership Agreements
- List of laboratories and equipment
- On-site visit
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
During the discussions, the peers learn that the CMI was funded by project money when it was first established. It is now covered by the University of Sorbonne within the Faculty of Science and Engineering. As many courses of the CMI are utilized in several degree programmes, the additional cost for the CMI is very low.

The CMI utilizes resources at two campi of the University of Sorbonne. Lectures and classes are mostly based at the Pierre et Marie Campus (Jussieu, Paris), while the practical units are often taught Saint-Cyr l'École campus. The Saint-Cyr site allows experiments in mechanics (fluid mechanics, solid mechanics, vibration mechanics, acoustics), energy (energy foundations and efficiency, renewable energies), electromagnetism and robotics (mobile and underwater). Transfer between the two sites takes about an hour. The Faculty of Science and Engineering is housed at the Pierre et Marie Campus.

Students have access to several libraries at the university, computer rooms and the fab lab. The university also provides Campus licenses for different software and master students can borrow a computer for their studies. During the discussions, both teachers and students show their satisfaction with the available resources. Though they say that it would be nice to have more dedicated space for student associations and students to do group work, they agree that overall there are enough spaces for group work and individual work. Rooms at the library can be reserved via the university website; free projects rooms are

accessible to students with a key. CMI students are also allowed to meet in the department's meeting room when it is not in use.

As stated before, the CMI is supported by research laboratories. The two main partners are the Jean Le Rond d'Alembert Institute (∂'Alembert; field of Mechanics, Acoustics and Energetics) and the Institute for Intelligent Systems and Robotics (ISIR). Other research laboratories implicated in the CMI programme are:

- The Laboratory of Biomedical Imaging (LIB; applied research on morphological, functional and molecular biomedical imaging methods on small animals and humans),
- The joint research unit Sciences and Technologies of Music and Sound (STMS; acoustics among others)
- The GeePs laboratory (different clusters: Materials, Electromagnetism: Physics and Engineering of Electromagnetism, Systems, Electronic and Electromagnetic)
- The LIP6 (Computer Engineering: Artificial intelligence and data science, Architecture, Systems, and Network, Safety, security and reliability and Theory and mathematics of computing)

Students are involved with these laboratories through different courses in the curriculum, the laboratory internships and projects. During the on-site visit, the peers were able to gain a comprehensive impression of the facilities and laboratories at the department of Mechanics. They were very impressed with the research laboratories ∂'Alembert and the Institute for Intelligent Systems and Robotics and especially with how the students are involved in the individual research projects. As a visit to the campus at Saint-Cyr l'École was not possible, the peers ask the HEI to provide further information on the infrastructure and equipment of the campus in Saint-Cyr.

Overall, the peers are very satisfied with the infrastructure for the CMI.

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

Criterion 4.1 Staff

The HEI does not address the question of the peers how the continuity of the programme management will be ensured. The peers maintain their requirement that the university must provide concept on how the continuity of the programme management will be guaranteed.

Criterion 4.3 Funds and Equipment

With their statement, the HEI provides additional information on the laboratories for undergraduate practical work, especially for the Saint-Cyr campus. The peers thank the university for the additional information and photographic evidence. They are satisfied that the available facilities and laboratories at both campuses support the CMI programme and the students to reach the intended learning objectives.

Overall, the peers regard criterion 4 as mostly fulfilled.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
The peers appreciate that the module descriptions were presented beforehand with the self-assessment report in an English translation. The module descriptions in French are available to students and teaching staff via the university website.

The module descriptions contain all necessary information: the module identification code, person(s) responsible for each module, teaching method(s) and work load , credit points, intended learning outcomes, module content, planned use/applicability, admission and examination requirements, form(s) of assessment and details explaining how the module mark is calculated, recommended literature and the date of last amendment made. Students will also be informed in the first session of a course about the date, form and weighting factor of each exam /continuous assessment (see criterion 3 exams).

The peers are overall very satisfied with the module descriptions, but would like to note that some of the learning outcomes could be more oriented to applicability of the acquired practical skills in addition to the current research-oriented focus.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Report
- Example of a CMI diploma

- Example of a CMI Transcript of Records
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
From the presented documents and the on-site discussions, the peers understand that at graduation every student who fulfils the CMI requirements is awarded a CMI Diploma and a Transcript of Records listing the modules and individual grades. However, U Sorbonne does not yet award a Diploma Supplement. Due to the recent restructuring of the university after the merger of the Universities of Paris-Sorbonne (Paris-IV) and Pierre-et-Marie-Curie (Paris-VI), the administration is so far unable to deliver a diploma supplement for the CMI. The programme managers and HEI management indicate that the university is working on this issue.

Nevertheless, the peers find it essential that all graduates are provided with a Diploma Supplement in English after their completion of the CMI programme. This Diploma Supplement should contain a concise description of the programme's learning outcomes, the list of modules and individual module grades of the student, the relative grade of the comparable graduates' cohort as well as information regarding the French system of higher education and the CMI system in particular. Such a Diploma Supplement will increase the national visibility and international comparability of the graduates and facilitate the employment process as employers receive a complete set of information together with the applicant's Diploma.

Criterion 5.3 Relevant rules

Evidence:

- Internal Rules
- Examination Regulations
- Self-Assessment Report
- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
From the documents provided as well as the discussions during the on-site visit, the peers assess that all required rules and regulations are made accessible to students and are published on the university website. In addition, each student signs a pedagogical contract ("charte d'engagement") at the beginning of each year that clarifies the syllabus of the CMI and the requirements for the CMI label. The contract is countersigned by one of the programme managers. In the welcome package, students are informed about the different

rules and regulations and where to find them. The Website of the Figure Network gives information about the CMI structure in general.

The discussion with the students confirms that they feel well informed about regulations and comfortable about the access to any information pertaining their degree programme. Again, the good communication between the students and the teaching staff as well as the mentoring programmes should be underlined as they support the transparency and accessibility of information.

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

The HEI provides exemplary Diploma Supplements for the Bachelor and Master degree. The peers appreciate that the students receive a diploma supplement with their Bachelor's and Master's degrees that shows all teaching units they followed, including the CMI related units, and that includes information on the CMI. Nevertheless, the peers find it essential that all graduates are provided with a Diploma Supplement in English for the CMI label itself after their successful completion of the CMI programme. Such a Diploma Supplement will increase the national visibility and international comparability of the graduates and facilitate the employment process as employers receive a complete set of information together with the applicant's CMI label and other degrees. Given that the Figure network currently prepares a template for such a CMI-specific diploma supplement, which will be made available to universities offering CMI programmes, the peers maintain the requirement regarding a CMI-specific diploma supplement.

The peers regard criterion 5 as mostly fulfilled.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Examination Regulation
- Statistics about students
- Questionnaire used for the evaluation of courses
- Results of the evaluation of courses
- Self-Assessment Report

- Discussions during the on-site visit

Preliminary assessment and analysis of the peers:
From the documents presented and from the discussions during the on-site visit the peers gain an impression of the quality management procedures that are in place for the CMI Mechanics.

All CMI programmes are subject to the quality assurance system of the Figure network, which has been evaluated and validated by the French accreditation council Hcéres. Figure regularly assesses the CMI programmes offered. For the assessment, the university provides a Self-Assessment Report (SAR) for the Figure accreditation criteria, which also includes an evaluation if each criterion is achieved, partially achieved or not achieved. The SAR should also include an action plan for criteria not (fully) achieved. The action plan is discussed with the stakeholders (such as students, teachers, …) of the CMI and then assessed by a committee of peers from Figure. The underlying Bachelor and Master in Mechanics are subject to national accreditation and their "pedagocial model" is assessed regularly in preparation for the national accreditation. This means that the programme managers of the CMI Mechanics assess their programme at least once every five years and discuss the curriculum, including the learning objective, and intended improvement measures with all stakeholders.

The University of Sorbonne has also established several quality management measures for all study programmes offered. This includes the development council for each study programme, course evaluations, student and graduate surveys.

The Development Council is a board with representatives from teaching staff and students that discusses the study programme, including the learning objectives, and suggests changes. At the Faculty of Science and Engineering, there is a joint committee for the Bachelor, Master and CMI Mechanics. The Council meets twice a year. A Professional Development Council (Conseil Perfectionnement) consists of representatives from industry and academia and assists in developing the competency profile and curriculum in their yearly meeting.

The students evaluate all modules offered in a semester at the end of the semester. Teachers receive the results of the evaluation, analyse the feedback and discuss it with their colleagues. Some also discuss the feedback and the resulting changes with their students. The decision to do so is the pedagogical prerogative of the teacher, as French law of higher education gives them high freedom in their pedagogical choices. The peers would like to see the feedback loop closed more often, but know that the CMI students are well-informed about the quality development of the CMI (see below).

Additionally, as modules are offered for several study programmes at once and evaluated by all students, it is not possible to differentiate the feedback based on the different study programmes. The same is true for the survey on student life and the graduate survey, which the faculty organizes each year. The faculty board discusses the aggregated results of the anonymous survey and proposes actions. The results and intended actions are published and communicated to the students. The follow-up on the defined actions are again discussed in the faculty board and with the HEI Management.

There are no surveys specific to the CMI yet. However, the peers learn during the discussions that there is an active discourse among and between students, teachers, programme managers and industry partners.

In regular meetings, the teaching staff discusses topics such as the semester, curriculum, student work and required support, partnerships with industry and other schools. Afterwards teachers tweak the content of modules to better suit the overall curriculum and include current research developments. Staff from other departments are consulted on how to improve the study programmes and the relation with the other department for example regarding integrated classes or the modules offered.

Teachers receive feedback from the CMI students in personal discussions, especially during the projects. Results of the course evaluations as well as improvement measures are discussed among teaching staff. The CMI lives an open door policy, so students feel free to offer their feedback. The programme managers organize feedback meetings at the beginning, middle and end of the Semester for the CMI itself, there are additional feedback meetings organized by the Mechanics department with student representatives. Each cohort of the CMI also elects a class representative, which serves as an additional conductor of feedback. During the on-site discussions, the student and alumni state that their feedback is valued and taken into account, e.g. regarding the distribution of workload or duplication in the curriculum. Alumni can comment on the CMI during the graduate survey or during the meet-ups between current students and alumni, which are organized by the alumni association.

Industry representatives have been involved in the CMI from the beginning. As the CMI Mechanics was one of the first CMI to be established, the programme managers closely worked together with industry partners to develop the programme. This involvement continues in yearly meetings, some industry partners are also part of the pedagogical committee (Development Council). After each internship, the industry supervisor fills out a questionnaire and gives feedback on the profile of the student during the defense of the internship report. This, together with feedback during personal discussions, is then reviewed during the meetings of the teaching staff.

The peers understand that the communication between the different stakeholders works very well. Feedback is given and taken into account. However, the feedback structure and overall Quality Assurance Processes, especially the responsibilities and mechanisms for the purposes of the continued development of the CMI, should be documented. Other than that, the practiced quality management is suitable to evaluate and improve the study programme.

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

In their statement, the university details how the quality management is ensured for the CMI programme. The quality management system consists of regular meetings with the students (regarding general information, specific information for mobility, research internships, defence of reports/thesis, ...), which enables students to give and receive feedback directly regarding these topics. These meetings also allow to inform students about developments and quality improvement measures regarding the CMI.

The teaching team also regularly discusses the CMI, pedagogical practices, the evolutions to be envisaged on the programme, student results, etc. in formal meetings as well as in informal exchanges. Formal occasions include the Bachelor's Department Council (3 per year), the Master Department Council (3 or 4 per year), the Development Council involving industrial partners (2 per year), pedagogical meetings to discuss the programmes offered by the faculty (2 or 3 per semester) and the juries for each semester/diploma/project support/internships.

Additionally, there are also CMI-specific surveys such as course evaluations for the CMI-specific modules and yearly surveys of the CMI programme. The HEI provides an example of both surveys.

The peers thank the university for the clarification of the established quality management processes. However, the peers still find it necessary to document the responsibilities and mechanisms for a continuous development of the study programme in a binding way.

They are nevertheless convinced that the quality management measures of the study programme are well-established and suitable. Overall, the peers regard criterion 6 as mostly fulfilled.

D Additional Documents

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

D 1. information on the basic labs for undergraduate practical work: staff, materials, equipment

D 2. a calculation of the average workload of the projects and internships

E Comment of the Higher Education Institution (24.07.2020)

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

- information on the basic labs for undergraduate practical work: staff, materials, equipment
- a calculation of the average workload of the projects and internships
- exemplary Diploma Supplements for the CMI
- CMI graduate survey
- Questionnaire for course evaluations

F Summary: Peer recommendations (06.08.2020)

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
CMI Mechanics	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 4.1) Provide a concept on how the continuity of the programme management will be guaranteed.

A 2. (ASIIN 5.2) Ensure that after graduation, students receive a Diploma Supplement, which contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

A 3. (ASIIN 6) Ensure that responsibilities and processes for the purposes of the continued development of the study programme are defined and binding.

G Comment of the Technical Committee 01: Mechanical Engineering/Process Engineering (03.09.2020)

The Technical Committee discusses the procedure and follows the assessment of the peers without any changes.

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 accreditaiton
CMI Mechanics	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 4.1) Provide a concept on how the continuity of the programme management will be guaranteed.

A 2. (ASIIN 5.2) Ensure that after graduation, students receive a Diploma Supplement, which contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

A 3. (ASIIN 6) Ensure that responsibilities and processes for the purposes of the continued development of the study programme are defined and binding.

H Decision of the Accreditation Commission (17.09.2020)

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

The Accreditation Commission discusses the procedure and follows the assessment of the peers without any changes.

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

The Accreditation Commission deems that the intended learning outcomes of the degree programme comply with the engineering specific parts of Subject-Specific Criteria of the Technical Committee 01.

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

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditaiton
CMI Mechanics	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 4.1) Provide a concept on how the continuity of the programme management will be guaranteed.

A 2. (ASIIN 5.2) Ensure that after graduation, students receive a Diploma Supplement, which contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

A 3. (ASIIN 6) Ensure that responsibilities and processes for the purposes of the continued development of the study programme are defined and binding.

I Fulfilment of Requirements (17.09.2021)

Analysis of the peers and the Technical Committee

For all degree programmes

A 1. (ASIIN 4.1) Provide a concept on how the continuity of the programme management will be guaranteed.

Initial Treatment	
Peers	Fulfilled. Justification: The provided document indicates in a satisfactory manner how the programme management is to be continued.
TC 01	Fulfilled Vote: unanimous Justification: The Technical Committee discusses the procedure and follows the assessment of the peers without any changes.
AC	fulfilled Vote: unanimous Justification: The Commission follows the assessment of the peers and committees without any changes.

A 2. (ASIIN 5.2) Ensure that after graduation, students receive a Diploma Supplement, which contains detailed information about the educational objectives, intended learning outcomes, the structure and the academic level of the degree programme as well as about the individual performance of the student.

Initial Treatment	
Peers	Fulfilled. Justification: the submitted evidence indicates that students receive a diploma supplement as indicated by the requirements.
TC 01	Fulfilled Vote: unanimous Justification: The Technical Committee discusses the procedure and follows the assessment of the peers without any changes.
AC	fulfilled Vote: unanimous Justification: The Commission follows the assessment of the peers and committees without any changes.

A 3. (ASIIN 6) Ensure that responsibilities and processes for the purposes of the continued development of the study programme are defined and binding.

Initial Treatment	
Peers	Fulfilled. Justification: The provided documents indicate that the responsibilities and processes for the purposes of the continued development of the study programme are defined and binding.
TC 01	Fulfilled Vote: unanimous Justification: The Technical Committee discusses the procedure and follows the assessment of the peers without any changes.
AC	fulfilled Vote: unanimous Justification: The Commission follows the assessment of the peers and committees without any changes.

Decision of the Accreditation Commission (17.09.2021)

Degree programme	**ASIIN-label**	**Subject-specific label**	**Accreditation until max.**
CMI Mechanics	All requirements fulfilled	EUR-ACE®	30.09.2025

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 Cursus Master en Ingénierie: Mécanique / CMI Mechanics:

CMI SU learning outcomes: disciplinary and scientific fundamentals			
Fundamentals and disciplinary prerequisites in mathematics, physics, mechanics and informatics	CD 1	Master a base of mathematical knowledge essential for modelling and solving mechanical problems	D1
		Know the basic concepts of imperative programming and algorithmic	D2
		Know a programming language	D3
		To master numerical simulation methods in mechanics	D4
		Master the fundamental concepts of physics and mechanics: fundamental laws, forces, displacement, speed, energy, etc	D8
		To master the fundamental concepts of the mechanics of continuous media in solids, fluids and gases	D12
		Formulating equations and boundary conditions for a mechanical problem	D13
Numerical methods	CD 2	Implementing basic algorithms for scientific computation in mechanics	D5
		Evaluate a numerical solution, analyse, interpret the results produced by the execution of a program	D6
		Acquire data, process it, design and operate computer databases	D7
Physic analysis and practice	CD 3	Qualitative analysis of a simple physical phenomenon in its environment, integrating a good vision of space and its representations, knowing how to isolate a system	D9
		Estimating orders of magnitude, manipulating units, running balance sheets	D10
		To know and use independently measurement devices and experimental techniques common in various fields of mechanics / physics	D11
Mechanical Analysis	CD 4	Analytically or numerically solve mechanical problems, interpret the results and exploit them.	D14
		Validate a model by comparison with experimental and numerical results and assess the limit of validity.	D15
Numerical applications in mechanics	CD 5	Use calculation codes, dedicated software in a thoughtful and critical way	D16
		Assess the relevance of hypotheses and solve a complex problem by successive approximations.	D17
Electronics, electrical engineering	CD 6	Know the basic concepts, practices and techniques used in electronics, electrical engineering and automatic (D18)	D18
Engineer's approach	CD 7	To implement (all or part of) the mechanical engineer's approach combining observation, experimentation, modelling and simulation, design	D19

CMI SU learning outcomes: disciplinary advanced (CDS)			
Energy and Environment speciality	EE	To master the fundamentals of energy transfer: thermodynamics, thermics, reactive fluids, …	E1
		Model, simulate and analyse reactive flows in various systems (combustion engines, turbo machines, pumps, fans, wind turbines, …	EE2
		Design and dimension energy conversion systems that are optimal in terms of consumption and environmental pollution.	EE3
		Conduct research to develop generic processes and innovative energy solutions.	EE4
Acoustic speciality	Acou	To master the fundamentals of acoustics: waves, vibrations, infrasound, ultra sound, propagation in solid and fluid media.	A1
		Identify, model and study the phenomena of acoustic generation and propagation.	A2
		Measuring and analysing signals and acoustic fields	A3
		Exploit acoustic fields for applications in physical, industrial and architectural acoustics (exploration, diagnosis, sound ambiences,..)	A4
Fluid Mechanics and Applications speciality	MF2A	Master advanced concepts in fluid mechanics: hydrodynamics, aero-dynamics, aero acoustics, multiphase flows, instabilities, …	F1
		Developing high-performance models for the study of complex flows.	F2
		To develop efficient numerical algorithms adapted to the flow configurations encountered in fundamental research and industrial applications.	F3
		Perform numerical simulations in fluid mechanics and thermal mechanics on real problems and analyse the results.	F4
Solid Mechanics: Materials and Structures speciality	MS2	Master advanced concepts in mechanics of structures and materials: behaviour, rupture, damage, instability, slender structures…	S1
		To develop efficient numerical algorithms adapted to the problems of materials and structures encountered in fundamental research and industrial applications.	S2
		To develop high-performance models for the study of the behaviour of complex structures in their industrial environment.	S3
		Analyse, dimension, control and optimize structures in terms of strength, deformation, stability and rupture according to a specification.	S4
Computational Mechanics	Comp Mech	Model advanced problems combining fluid and solid mechanics	C1
		Implementing advanced discretization and numerical resolution techni-ques using modern open source software for high performance computing	C2
		Evaluate the relevance and effectiveness of models and simulations	C3
		Propose, design complex systems including fluids, solids and soft materials	C4
Advanced Systems and Robotics	SAR	Master advanced concepts in signal processing, fundamental automation, robotics and artificial intelligence.	R1
		Programming digital signal processing algorithms, servo loops, control loops, optimization algorithms,..	R2
		Designing a mechatronic system from the requirements specification, defining its actuators, sensors, input/output and conversion interfaces.	R3
		Analyse and model robotic systems and their automation.	R4

CMI SU learning outcomes: Transferable and pre-professional			
Basic languages,		Fluency in English (TOEIC certification, 785 pts min or TOEFL	OL1

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foreign languages and cultures, certifications		Master the rules of syntax, spelling and textual consistency of the French language.	OL2
		Communicate results in writing and orally, use numerical tools for communication.	OL3
		Research, analyse, and exploit various documentary sources.	OL4
Personal developement, personal project	**Axis 2.1: Acting autonomously and taking initiatives**		
		To organize oneself, to have working methods, to manage one's time	OA1
		Communicating thoughts, reasoning, arguing, making judgments, and expressing oneself concisely.	OA2
		Knowing how to self-evaluate, presenting one's skills and experiences in writing and orally	OA3
		Take initiatives, act independently, learn about entrepreneurship	OA4
	Axis 2.2: Be open to the diversity of ways of acting, cultures, environments		
		Opening up to the history of science and technology, philosophy and sociology, ethics	OO1
		Address creativity methods, Become aware of innovation in building solutions.	OO2
	Axis 2.3: To cooperate, to situate oneself in the interactions		
		Learn about and implement project management methods.	OC1
		Working in a team, knowing how to position oneself, taking responsibilities, being cost effective, delegating, learning about team management methods.	OC2
Understanding professional environments		Understand how companies work, the history of companies, the economic stakes, learn about marketing	OE1
		To build one's personal and professional project, to situate the professional fields associated with mechanics and robotics in their different sectors	OE2
		Know how to write a resume and cover letter; know how to prepare for an interview, know how to search for work	OE3

The following **curriculum** is presented: