ASIIN Seal & EUR-ACE Label

Accreditation Report

Degree Programme :
Cursus Master en Ingénierie : Géologie Appliquée
CMI Applied Geology

Provided by
University of Franche-Comté, Besançon, France

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 Géologie Appliquée	Applied Geology	ASIIN, EUR-ACE® Label	-	11, 03
Date of the contract: 11.05.2020 **Submission of the final version of the self-assessment report:** 21.05.2020 **Date of the onsite visit:** 15.07.2020 **at:** University of Franche-Comté				
Peer panel: Prof. Dr. Bernd Lehmann, Technical University of Clausthal; Prof. Dr. Emmanuel Tertre, University of Poitiers; Dr. Hans-Jürgen Weyer, German Professional Association of Geoscientists; Bastien Penninckx, student representative, University of Montpellier.				
Representative of the ASIIN headquarter: Arne Thielenhaus				
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 11 – Geosciences as of 9th December, 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 03 - Civil Engineering, Geodesy and Architecture; TC 11 - Geosciences.

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 Géologie Appliquée	Applied Geology		6/7	Full time, sandwich course	-	10 Semesters	360 ECTS	Fall / Spring

For the Applied Geology CMI degree programme, the institution has presented the following profile in the self-assessment report:

“The objective of the Applied Geology CMI is to train engineers who are both practicing geologists with a very good knowledge of applied geology techniques and methods and executives capable of taking responsibility, defining and then solving a problem, providing decision support for local authorities, private companies in particular in the fields of geology and the environment. The skills acquired allow a possible continuation of courses towards a PhD in geosciences.

Students find jobs in the fields of geotechnics (civil engineering, infrastructure), hydrogeology (groundwater, geothermal, remediation), and mineral resources (exploration, exploitation, mines and quarries). Employers are in the private sector (consulting firms, SMEs and multinationals) and in the public sector (territorial administrations and public institutions).

The CMI GA is based on a three-year Bachelor's degree in "Earth Sciences" followed by a two-year Master's degree in "Georesources, Geohazards, Geotechnics", Applied Geology with a specialization in M1 and M2: geotechnics, hydrogeology, or mineral resources.

After five years of study, the GA CMI student will have acquired knowledges to carry out scientific reflection and multi-scalar analyses in the fields of applied geology. This is favoured by a continuous approach from the sample to the field scales, based on: Fundamental knowledges (mathematics, physics, chemistry, earth sciences, etc.) and methodological knowledges (GIS, metrology, etc.); in the fields of engineering sciences (geophysics, rock

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

mechanics, modelling, etc.) and specialization (geological field surveys, soil mechanics, hydrogeology, risks, etc.)..).

The particularity of the Applied Geology CMI is the dual apprenticeship in Master's degree guaranteeing an excellent career integration.”

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:

- Self-assessment report
- Meeting notes from the annual meeting of the Education Improvement Board (2018, 2019, 2020)
- Matrix ASIIN SSC Geosciences
- List of Desired Learning Outcomes from Programme Website: http://geosciences.univ-fcomte.fr/download/cmi-geol-app/document/departement/formations/compcmi.pdf

Preliminary assessment and analysis of the peers:
As stated in the Self-assessment report (SAR), the objective of the Applied Geology CMI programme is "to train engineers who are both practicing geologists with a very good knowledge of applied geology techniques and methods and executives capable of taking responsibility, defining and then solving a problem, providing decision support for local authorities, private companies in particular in the fields of geology and the environment." The Applied Geology CMI programme has been developed in close cooperation with the Figure Network, a network consisting of French research universities whose objective is to provide high quality engineering training. To this end, CMI programmes are intensive, project-based, research-focused and practice-oriented, with an average workload of 36 ECTS per semester. A highly-selective admissions process aims to ensure that the programme participants achieve the desired learning outcomes.

As explained in the SAR, the list of skills to be obtained by students in the course of the programme has been discussed with the entire teaching team, company representatives

[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.

and student representatives who are part of the programme's education improvement board, which meets annually. The University provides the meeting notes from the last three meetings of the board. The peers are thus satisfied that relevant stakeholders were included in the process of formulating and further developing the objectives and learning outcomes.

The targeted learning outcomes, which are divided into three categories, including disciplinary skills, pre-professional skills and transversal and linguistic skills, are reviewed at least every four years. The University supplies a matrix describing how the ASIIN subject-specific criteria (SSC) of the Technical Committee 11 are covered by the programme's learning outcomes. The list of desired learning outcomes / competences is also published on the programme website and is provided in the appendix of this report. A brief overview of the skill categories is provided in the self-assessment report:

A. Disciplinary skills (CD):

- Related Sciences (CD1.SC)
- Fundamental Concepts in Geoscience (CD2.G)
- Field Practice (CD3.T)
- Laboratory Data Acquisition and Geological Data Interpretation (CD4.ID)
- Geological Models (CD5.M)
- Specific Practice (in Applied Geology) (CD6.GA)

B. Pre-professional skills (PC):

- Role within organizations (CP1.R)
- Position in the economic world (CP2.P)
- Project Management (CP3.G)

C. Cross-cutting and language skills (TC):

- Communication (CT1 and CT5)
- Bibliographic search (CT2)
- Data Synthesis and Critical Analysis (CT3 and CT8)
- Scientific discussion (CT4)
- Communication in English (CT6)
- 24 ECTS are dedicated to developing the students in terms of social, economic and cultural openness (SECO). The acquisition of digital skills is also a priority, with 39 ECTS dedicated to this.

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 11 – Geosciences. 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, including knowledge and understanding, engineering analysis, engineering design, investigation, engineering practice, making judgements, and life-long learning. These will also be discussed in subsequent parts of the accreditation report.

The University supplies a list of graduates and their current employers. The panel also has the opportunity to speak with programme alumni and finds that they all work in companies and positions related to their studies and specialization. The panel is thus of the opinion that the qualifications profile allows the students to take up an occupation which corresponds to their qualification.

Criterion 1.2 Name of the degree programme

Evidence:

- Diploma Supplement
- Self-assessment report

Preliminary assessment and analysis of the peers:
The panel considers the French and English names of the study programme to adequately reflect the respective aims, learning outcomes and curricula. The "CMI" (Cursus master en ingénierie) reflects its association with the Figure Network.

Criterion 1.3 Curriculum

Evidence:

- Self-evaluation report
- On-site discussions
- Curriculum
- Module-Learning-Outcome Matrix
- Module descriptions

Preliminary assessment and analysis of the peers:

In accordance with the CMI model, the curriculum of the Applied Geology programme combines the contents and learning outcomes of a Bachelor's (License) and Master's degree in a 10 semester study-period. The programme is divided into four training components, including "core disciplines and specialty" (CDS), "fundamental disciplines" (FD), "scientific complements" (SC), and "social, economic and cultural openness" (SECO). The percentage of these components is in alignment with the FIGURE Network criteria. An overview of the ECTS credit points devoted to each area is provided in the table below.

TABLEAU 1 COMPONENTS OF BACHELOR'S AND MASTER'S DEGREES

Disciplines	License	Master	Total
CDS	87 ECTS	93 ECTS	180 ECTS
FD	54 ECTS	18 ECTS	72 ECTS
SC	36 ECTS		36 ECTS
SECO (OSEC)	39 ECTS	33 ECTS	72 ECTS
Total	216 ECTS	144 ECTS	360 ECTS

As noted in the SAR, so-called Situtation-Setting Activities (IAs) represent about 25% of the CMI progamme. They consist of short projects, long integrative projects and internships in companies and laboratories. The list of compulsory IAs is provided in Table 2 below.

TABLEAU 2 DISTRIBUTION OF COMPULSORY IAS OVER THE ENTIRE CURRICULUM.

IAs	Level	ECTS	duration
Engineering initiation project	MIC1	3	60 h
Immersion internship in a company	End of CMI1	3	5 weeks
Literature review project	CMI2	3	60 h
Long integrator project	CMI3	6	120 h
Specialization internship in a laboratory or in a company	End of CMI3 or of CMI4	9	10 weeks
Long project integrator in laboratory	CMI4	6	160 h
End-of-studies internship in a laboratory or in a company	CMI5	24	24 weeks

The panel discusses at length with the programme coordinators, teachers and students the different types of projects that the students complete in the programme. In the first year, the students are obliged to complete a two-week project involving the design and development of a technical device, for example a geophone, with minimal instructions. In the course of this project, the students must quickly acquire skills and knowledge, which can include for instance basic programming of Arduino robots and electronic circuitry. The aim of the project is to teach students how to develop technical solutions on their

own with minimal guidance. The peers are very impressed with this project and recognize its value.

As the programme is applying for the EUR-ACE label, the peers focus during the on-site discussions on how, aside from the first year two-week project, the programme prepares students to create and design complex products, processes and systems, i.e. what other engineering components are present in the curriculum. The staff, students and alumni explain that while the students also create or design physical objects, the focus mostly lies on analysing geological environments and developing processes and systems to solve specific problems. Some of the alumni for instance report working on the dimensioning of construction sites while taking into account underground water levels, or developing a strategy to remediate a contaminated site, or developing a process to reuse excavated material, taking into account technical aspects as well as environmental regulations. The panel takes note of these examples as evidence that the programme teaches students to analyse and design complex products, processes or systems related to their field, but asks the University to provide an explanation and a sample list of projects in the programme, demonstrating that students in all three specialisations achieve these competences.

Based on the provided curriculum, module descriptions and the Module-Learning-Outcome Matrix, the panel can clearly see which knowledge, skills and competences students will acquire in each module and how the overall objectives and intended learning outcomes for the degree programme are systematically substantiated in individual modules.

Criterion 1.4 Admission requirements

Evidence:

- Self-assessment report
- On-site discussions

Preliminary assessment and analysis of the peers:
Admission to the CMI Applied Geology programme is via *Parcoursup* (https://www.parcoursup.fr/). This national platform used to apply to higher education programmes was implemented by the French Ministry of Higher Education, Research and Innovation in 2018. The admission requirements are clearly detailed on the platform. Eligibility criteria are based on the results of the "Première" and "Terminale" High School scores in Mathematics, Chemistry, Physics and Life and Earth Sciences and English, as well as on the recommendations of the teachers and the motivation of the student. Students who apply via *Parcoursup* can see the marks of the students who were admitted to the previous cohort and are thereby able to better estimate their own chances of being admitted. As reported by the

programme coordinators, admission to the CMI programme is very selective. The University makes an initial selection on the basis of the student's grades, followed by a roughly 20-minute interview with the admissions committee. Among all the applications, a maximum of 18 students can be selected for the CMI GA. This is due to the fact that the available equipment and teaching resources cannot support a larger number of students. According to the programme coordinators, the cohort-size has never reached 18 students because a number of students prefer the regular, less intensive programme, or prefer to study at different institutions. They note that there was a marked decline in the number of applications to both the regular Applied Geology programme as well as the CMI programme in the last years. However, this decline appears to have ended in the current year, in which a cohort size of 14 students is expected. The panel is thus satisfied that the continuation of the programme is given.

During the on-site discussions, the peers learn that the admissions committee is particularly interested in the students' motivation for joining the degree programme. This is because in the past, the programme coordinators found that good performance in the programme was linked more to students' motivation rather than good performance in high school. As a result, students who may lack good marks in some areas may still be accepted if they show they are motivated.

Students who decide to apply to the CMI GA can also enter the programme during the second year based on their results during the first year at university. The students who enter the second year of the CMI program can postpone the first-year "immersion" internship in a company to the end of this second year. They must have acquired, from another earth-science programme, the minimum credits (ECTS) required in the CMI program. For example, students who have completed a two year degree called "Technicien Civil Ingénierie diplome (BTS)" can be admitted into the second year of the CMI GA programme. Students admitted in the second year may be required to compensate some of the missed classes through additional courses. This is established on a case-to-case basis.

Overall, the panel finds the progamme's admission criteria and procedures to be binding, transparent and structured in a way that supports the students in achieving the learning outcomes.

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

With regards to the curriculum, the University provides an explanation and list of examples of how the CMI GA programme fulfils the EUR-ACE Engineering design criterion. The list includes projects performed in the past three years by CMI students in the course of their

apprenticeships / internships. According to the University, these demonstrate that students from the three specialisations achieve the expected engineer learning outcomes during a variety of teaching activities, including projects and internships in companies.

Based on the provided examples, the peers note that students have developed numerical models in different topics as in (i) hydrology to understand and predict aquifer properties and (ii) structural geology to explain the rule of intrusive rock implementation in the thermal evolution of the Earth's crust. The peers are of the opinion that these models aim to quantitatively understand the functioning and evolution over time of complex natural systems. Several other projects are dedicated to designing new in-situ geotechnical tests, for example related to dimensioning hydraulic structures in civil engineering or to sizing foundations for solar farms. Working on these type of projects involves the development of methodologies, requiring skills in different disciplines (geology/mechanics/physics/mathematics) and taking into account technical constraints. Finally, other projects conducted by individual students during their internships, including (i) finding new solutions to stabilize tailing issued from mining activities directly on geological site, and (ii) working on a new concrete product based on cold emulsion techniques, serve as additional evidence that students learn to solve real problems taking into account a variety of different constraints (environmental, economic, ethic, safety, etc.).

With these projects, the students build on the "Initiation Research Project" in the first year, the "Field and Cartography" field project in the second year, and the "Field practice" course. In the opinion of the peers, these different projects, together with the other theoretical courses proposed in this program, ensure that the EUR-ACE learning outcomes related to analysis and design of complex products, processes and systems are achieved.

In the discussion with the companies and the former graduates of the CMI program the peers learnt that the capability of the graduates to analyze, design and develop complex products, processes and systems was decisive to get employed. The graduates were able to obtain a job that also could have been taken by engineers.

The peers thus conclude that the criterion is fulfilled.

2. The Degree Programme: Structures, methods & implementation

Criterion 2.1 Structure and modules

Evidence:

- Module Descriptions
- Programme Kit
- Curriculum
- Website of the University's study-abroad offers: https://www.univ-fcomte.fr/partir-letranger#.XxhDIW5uJaR

Preliminary assessment and analysis of the peers:
The University provides a syllabus, according to which the programme is divided into 10 semesters, each of which composed of modules of 2 to 6 credits, with an average of 36 credits per semester in total. Lessons can be in the form of lectures, tutorials, practical work or group or pair projects. The learning/teaching methodology as well as the learning objectives are detailed in the module descriptions.

The first three years of the CMI programme follow the curriculum of the University's Earth Sciences Bachelor degree programme, and the final two years that of the regular Applied Geology Master degree programme – in fact, the students of the CMI programme and the regular programmes visit many of the same modules. However, certain additional modules are particular to the CMI programme and support the achievement of this programme's learning outcomes.

The University provides a "Programme Kit" which illustrates which learning outcomes are achieved in which modules. In the "Bachelor" years of the programme (years one to three), the students acquire general theoretical and practical knowledge in earth sciences and build up communication, project and teamwork skills. The programme follows a progression in the acquisition of the targeted learning outcomes, culminating in a division into three specialities during the "Master" years four and five (geotechnics, hydrogeology, and mineral resources). Students are required to choose one of the three specialties and must complete three specialization modules with a total volume of 15 ECTS.

A key part of the programme involves "situation-setting activities", representing 68 ECTS. These include activities designed to give students all skills related to geological terrain analysis (observation, data acquisition, interpretation, etc.). Field activities are provided in the form of days and half days in the vicinity of Besançon but also in the form of field courses lasting more than a week, given in autumn and spring in other regions of France with the aim of training students in different geological contexts. These field courses are spread across all five years of the programme.

The curriculum also includes so-called SECO units, which help build students' communication skills and understanding of company management and operations. Most SECO units are common with the other CMI programmes of the UFC. In addition, 25 credits are devoted to English language courses with the aim of a TOEIC certification at B2 level at the end of the Master's degree. Students also acquire digital skills throughout the programmes. These e-skills are quantified via the PIX national platform for the different digital themes to be established by the National Group CMI training in Geosciences.

The University provides an overview of all internships (see figure below), amounting to a total of around 14 months. The panel can see that the workload overall during the last two years does not exceed the average 36 ECTS per semester. During the on-site discussions the peers also learn that all students have a tutor, who checks up on them during the internships and ensures that the projects are of a suitable nature. Most of the internships in the final years take on the form of a dual-apprenticeship, in which the employer pays the student-apprentice a salary as well as his or her tuition fees. The students' final research projects are frequently related to these internships. According to the programme coordinators and staff, thus far all students were able to find internships. In cases where a student is unable to find an internship, the staff may organize one for the student in the University laboratory.

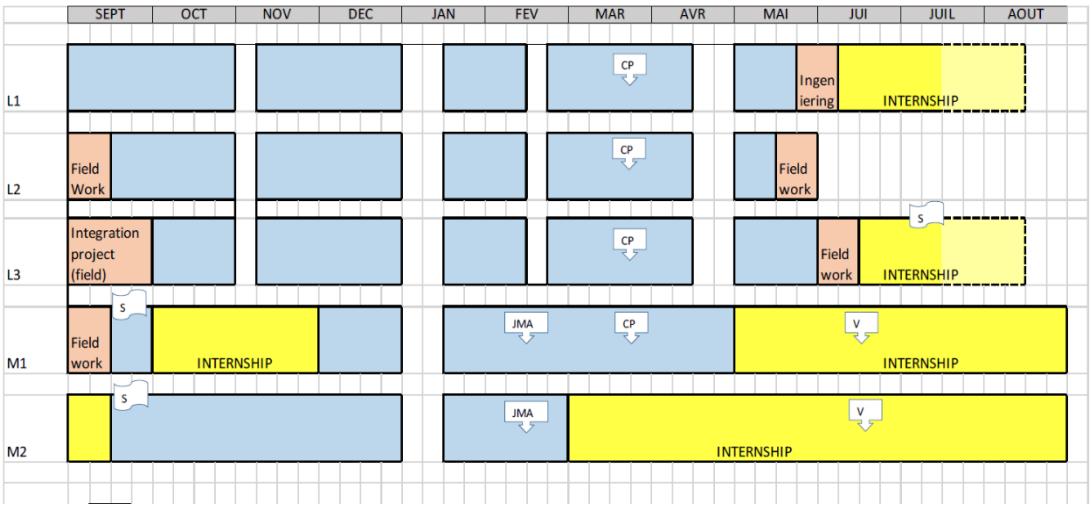

Figure: Overview of study periods, projects and internships

The students may participate in study-abroad experiences (one semester or one full year) or internships abroad. In these cases, the students must check with the programme coordinators which types of study-abroad experiences will be recognized by the University. In the past, several students from the programme have participated in study-abroad experiences, for example in Brazil and the United States. A map of these is provided in the self-assessment report. During the on-site discussions, the peers learn that some students are

planning international internships and study-abroad experiences. The University also has an international office, which supports students in finding suitable study-abroad opportunities. However, the University notes in the self-assessment report that the current number of study-abroad opportunities which can offer the CMI students an equivalent education is rather low.

Following the discussions, the panel is of the opinion that the internships are well-integrated into the curriculum and that they are adequate with regards to relevance, content and structure. Through the specializations, internships and study-abroad options, the students are able to define an individual focus and course of study. Based on the module descriptions, the peers recognize that the modules have been adapted to the requirements of the degree programme and help the students reach the qualification level and overall intended learning outcomes. The curriculum is structured in a way that allows the students to complete the programme without exceeding the regular course duration.

Criterion 2.2 Work load and credits

Evidence:

- Module descriptions indicate the workload (hours, ECTS)
- Annexe “AMS Numérique et Stages CMI GA”

Preliminary assessment and analysis of the peers:
The University uses the ECTS credit point system. On average, the students have a workload of 36 ECTS per semester, which is the typical workload of CMI programmes. As is reflected in the Annexe “AMS Numérique et Stages CMI GA”, one ECTS credit generally corresponds to 20 hours of student workload, including 10 hours of face-to-face teaching, as well as self-study. The panel notes that 20 hours per ECTS credit point does not fulfil the requirements of the ECTS User Guide, according to which an ECTS credit point should consist of 25-30 hours of workload. The panel therefore requires the University to make the necessary adjustments so that a credit point in the programme is associated with at least 25 hours of workload.

The proportion of self-study time increases as the students progress through the programme. Credit points are awarded for all mandatory parts of the curriculum, including the internships.

The University provides evaluation results, which indicate that the majority of students consider the workload to be adequate. In some semesters, the students report the workload to be a bit high, particularly in the second year. During the on-site discussions, the

students explain that the perceived workload is higher in the first years, particularly because they are new to University life. However, they consider the workload to be adequate. During the on-site discussions, the peers also learn that students who fail a semester are ejected from the CMI programme and fall into the "regular" Applied Geology programme, therefore there are no students exceeding the regular course duration. The panel concludes that, while the workload is significantly higher than in a typical study programme, the admission criteria ensure that candidates are selected who are able to master it, and that the feasibility of the programme within the prescribed course duration is given.

Criterion 2.3 Teaching methodology

Evidence:

- Self-assessment report
- Module descriptions
- On-site discussions

Preliminary assessment and analysis of the peers:
According to the SAR, lessons are provided in the form of lectures, tutorials, practical work, and projects in small groups of no more than 15 students. Practical work is done in a variety of dedicated lab rooms (microscopy room, mapping room, geotechnical room, computer/project rooms, common lab rooms). Courses are also held in the field to enable the student to apply the know-how acquired in the classroom and to confront him/her with real world situations. These courses are either supervised or self-directed.

An important part of the programme is devoted to project-based teaching. During the on-site visit, the teaching staff shows videos of additional student projects, including the two-week project in the first year already mentioned under criterion 1.3, in which the students are required to develop a geophone from scratch with very limited instructions. This project helps the students develop technical, creative thinking, project-management and teamwork skills. The peers also learn that the CMI students partake in improvisation theatre to build up oral communication skills. The students confirm that they find these exercises to be valuable. Modern technology is also utilized - as an example, two units of the second year (Methodology of Research and Projects in Geosciences) integrate virtual reality elements. As explained by the teachers, the students partake in numerous field excursions, and oftentimes collect data related to the staff's current research projects.

The peers learn that, due to the COVID-19 epidemic, most of the teaching has moved online. The students report that this has not resulted in significant problems – the teaching

staff is available to answer questions during live online sessions as well as via email. The staff is also working to digitalize geological samples, which will facilitate remote access. Practical exercises are still carried out in the laboratories, although group sizes have been reduced and additional hygiene measures have been implemented as a precaution.

Independent academic research and writing plays a role in several parts of the programme, beginning with a research initiation project as well as a bibliographic synthesis on a specific Earth Sciences research topic in the second year. In the fourth and fifth year, the students conduct additional research projects (Projet Tutoré) and write dissertations about the projects on which they work during their required internships. During the on-site visit, the panel has the opportunity to examine various research projects prepared by the students.

In conclusion, the peers find that the teaching methods and instruments used in the programme are creative and support the students in achieving the learning outcomes, including with regards to the EUR-ACE criteria related to engineering and research. As already mentioned under criterion 1.3, the peers are interested to receive a list containing further examples of engineering-related projects. The degree programme appears to be well-balanced between attendance-based learning and self-study. Familiarising the students with independent academic research and writing plays a vital role in the programme.

Criterion 2.4 Support and assistance

Evidence:

- Self-assessment report
- On-site discussions
- University website: https://www.univ-fcomte.fr/vie-etudiante

Preliminary assessment and analysis of the peers:
As described in the self-assessment report, the first and second year students benefit from a tutoring system. The tutors help the students in the elaboration of their personal and career skills assessment, the creation of a CV, the discovery of the professions of geology and the environment. The objective is to help them find a research internship in a company at the end of the first year.

The Applied Geology CMI programme has also a staff of secretaries with two people who manage the Bachelor's (and CMI) and Master's (CMI) degrees respectively. These persons receive the students and help them in the administrative part of their internship or dual apprenticeship. The semester supervisors and the CMI manager receive the students at the end of the semester to discuss their results if they pose a problem for their graduation.

During the final two years of the programme, each student has a tutor from University who will visit the student and the company during the long period of internship and discuss with the student the subject of his or her internship report.

The University website provides an overview of general services provided to students, for example with regards to study abroad issues, or matters pertaining to handicaps.

During the on-site discussions, the students report that they have a good relationship with the staff. The staff is available to support them with technical as well as general questions.

Based on the supplied documents, the university website and the discussions, the peers conclude that there are resources available to provide individual assistance, advice and support for all students, and that the allocated advice and guidance (both technical and general) on offer assist the students in achieving the learning outcomes and in completing the course within the scheduled time.

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

In its comments, the University notes that the previous documentation showed an incorrect workload per ECTS credit point. Along with its comments, the University submits a revised version of the syllabus in which each credit point is associated with a workload of 25 hours. This syllabus is also available online. The peers are subsequently of the opinion that the credit point system is in order and that the criterion is fulfilled.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation

Evidence:

- Self-assessment report
- Module descriptions
- On-site discussions
- Sample exams and dissertations

Preliminary assessment and analysis of the peers:
According to the self-assessment report, there is continuous evaluation for each module. Students have at least four tests per module with 6 credits and two for a module with 3 credits. The exams are intended to test the knowledge but also the know-how and interpersonal skills categorized as disciplinary, pre-professional and transversal skills. Some

modules are assessed via a written summary report prepared individually or in a group and/or via an oral presentation. The examination form for each module is indicated in the module description.

The rules for re-sits, handicap, illness and other mitigating circumstances are provided on the University's website. During the on-site discussions, the peers learn that the University adapted the examination rules due to the COVID-19 pandemic, to ensure that safety standards can be upheld.

At the Master level (years 4 and 5), the students have long periods of internship (or apprentice) in a laboratory or company. At the end of each period, they must complete a dissertation project and an oral presentation. The dissertation at the end of the first year focuses on data acquisition and the methodology of a specific technique of Applied Geology. The aim of the second year dissertation is broader and focuses on topics such as project management in applied geology, challenges, research and development. Students must present the state-of-the-art and develop a discussion about benefits, pitfalls and solutions. The oral presentation is followed by the Master and CMI graduation.

During the on-site discussions, the panel is able to view sample student dissertations and exams, and concludes that these cover the intended learning outcomes and adequately reflect the level of the programme. The number and distribution of the exams ensures that both the exam load and preparation times are adequate. All exams are organised in a way that avoids delays to student progression caused by deadlines, exam correction times, re-sits, etc.

The evaluation results show that in a number of cases, the students would like to not only receive their exam results but also the exams with the teachers' corrections. Furthermore, the results indicate that the students would like to receive exam results faster than has been the case thus far. In the self-assessment report, the University acknowledges that there is room for improvement in this regard. The panel encourages the University to follow through and implement measures to improve in these areas.

The peers note that students who fail an entire semester are no longer eligible for the CMI programme and CMI certificate. The peers understand that the CMI programme focuses on promoting the best students, but nonetheless suggest that the programme organizers consider adjusting the rules so that these students are given a second chance.

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

The University points out that the students who fail the CMI programme can still remain in the classical Bachelor and Master programme and are thereby already given a second chance. The peers were already aware of this and stand by their suggestion that students who fail a semester be given a chance to remain in the CMI programme. The peers see the criterion as fulfilled.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-assessment report
- On-site discussions

Preliminary assessment and analysis of the peers:

As discussed in the SAR, the GA-CMI relies on 18 lecturer-researchers from the BIOGEO theme of the Chrono-Environment Laboratory, UMR because of their expertise and research in the fields of prospecting, metallogeny, reservoir properties, hydrogeology and risk management. In addition, some of the research in the BIOGEO theme is supported by industrial partners (AREVA, BRGM, TOTAL, ERAMET, EDF), which is a major asset in linking CMI students with "partnership" research applied to industry. The education program is also supported by numerous industrial partners (Hydrogéotechnique, Imeris, Roger-Martin, Lafarge-Holcim, Sciences Environnement, Compétence Géotechnique....) who welcome the students every year for internships and apprenticeships.

After reviewing the profiles of the teachers and following the on-site discussions, the panel concludes that the composition, scientific orientation and qualification of the teaching staff are suitable for sustaining the degree. The panel furthermore positively notes that the teaching staff demonstrates a high level of motivation and a strong interest in the students and continuous development of the programme.

Regarding research, as mentioned under criterion 2.3, the peers learn during the discussions with the teaching staff that field trips are used not only to teach students but also to collect data related to various research projects. As a result, the staff are able to combine their research with their teaching.

Based on the discussions with teaching staff and students, there are sufficient staff resources available for providing assistance and advice to students and for administrative tasks. The teaching staff only noted that, with the continued growth of the fab-lab, it may be necessary to have additional staff support for managing the fab-lab equipment. The panel would like to pass this on to the University leadership.

Criterion 4.2 Staff development

Evidence:

- Self-assessment report
- On-site discussions

Preliminary assessment and analysis of the peers:
As noted in the self-assessment report, lecturers have the opportunity to partake in educational training courses (active learning and program-based approaches). The panel learns during the discussions that the CMI programme has led the involved teaching staff to experiment with new teaching methods, particularly with regards to program-based teaching. The panel also learns that as a result of the COVID-19 pandemic, the teachers had to move a large part of their pedagogical activities online. For this, they received the support of dedicated university staff, so-called “educational engineers”. The teaching staff notes that there are currently only 3-4 such educational engineers working in the entire university and that they are in high demand. However, they are of the opinion that the University is taking steps to increase these types of resources.

In conclusion, the panel is of the opinion that the resources and support mechanisms for teaching staff are sufficient, but encourage the University to develop these even further, by, for instance, offering teachers additional courses in pedagogical training and professional skills.

Criterion 4.3 Funds and equipment

Evidence:

- Self-assessment report
- On-site discussions

Preliminary assessment and analysis of the peers:
During the on-site visit, the panel is able to visit the facilities of the Geology Department, including classrooms, laboratories (including the "fab-lab"), storage rooms for field equipment and computer rooms. The peers also discuss the available resources with the students and staff, who are of the opinion that the resources meet their needs. They confirm that the internet connections are adequate and that all licenses for required software are available.

In the course of the on-site discussions, the programme coordinators note that the CMI Applied Geology programme does not have its own fixed annual operating budget, sharing instead the budget allocated to the University's regular Bachelor and Master Applied Geology programmes. The teachers are, however, compensated for the additional teaching time they dedicate to the programme.

In order to provide additional funds for programme activities, the programme coordinators draw on numerous sources. The majority of the CMI students participate in apprenticeships with companies, who help sponsor the students' studies with a fixed annual contribution to the programme. These contributions help finance new equipment as well as field excursions. The teaching staff reports that the University also generally responds positively to the teachers' requests for additional funding. The programme's "CMI" status also helps the staff obtain regional or national grants. Ultimately, the teaching staff are of the opinion that the continuous pursuit of external grants significantly exceeds any fixed operating budget they could receive from the University.

During the on-site visit, the staff demonstrates the "fab lab" and its efforts to digitalize more aspects of the programme using, for instance, 3D printing and scanning and virtual reality technology, which will provide students with additional opportunities to review samples from home, which they could otherwise only review in the field or in the lab. The students themselves are also involved in these digitalization efforts.

Following the on-site visit and the discussions, the peer panel is particularly impressed with the fab lab and is of the opinion that the funds, equipment and other resources available adequately meet the needs of the programme staff and participants. However, based on the recommendations of the teachers, the panel recommends that the University increases the number of group project rooms available to the students.

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

The peers see the criterion as fulfilled, but recommend that the university provides students with more group project rooms.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Module descriptions
- Programme website

Preliminary assessment and analysis of the peers:
The University provides the module descriptions as individual Excel files and also provides a link to where they can be found online. The University acknowledges in the self-assessment report that the module descriptions available online currently do not meet the ASIIN criteria. For instance, they do not include the intended learning outcomes, responsible persons for each module, recommended literature, details explaining how the module mark is calculated, and the date of last amendment. The peers note that many or most of the module descriptions provided as Excel files also do not include recommended literature, or details explaining how the module mark is calculated. There are also some errors; for instance, the module description for the internship in the fifth year indicates a workload of only 2 ECTS points, when according to the curriculum it should be 18 ECTS points. The peers require that the accurate and complete (i.e. meeting all the requirements of the ASIIN criteria) module descriptions are made available to the students.

The panel notes that in the future, it would also significantly support the peers' reviewing efforts if all module descriptions were included in a structured single document, rather than in individual files.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Sample Diploma Supplement (French)

Preliminary assessment and analysis of the peers:
The Diploma Supplement mentioning the CMI label is provided to students in French. A sample copy is provided by the University. The peers require that the University also provides an English-language version in accordance with the ASIIN criteria. The University agrees to supply this following the audit.

Criterion 5.3 Relevant rules

Evidence:

- Self-assessment report
- Chartre d'engagement pédagogique dans le Cursus Master en Ingénierie
- MODALITES D'APPLICATION DU REGLEMENT GENERAL DES ETUDES ET DES EXAMENS DE L'UNIVERSITE 2019-2020 PENDANT LA CRISE SANITAIRE NEE DE L'EPIDEMIE DE COVID-19 (http://admission.univ-fcomte.fr/documents/ufc/Modalites-d-application-du-RGEE-modifications-suite-Covid-19_validees-CFVU-15-04-2020.pdf)
- https://www.univ-fcomte.fr/documents-officiels-0#.XxWktCj7RaQ

Preliminary assessment and analysis of the peers:
The University submits a "Contract of pedagogic engagement" which the students must sign when committing to the CMI GA programme. The examination rules as well as all other official rules and statues are available on the University's website.

In conclusions, the peers see that the rights and duties of both the higher education institution and students are clearly defined and binding, and that all relevant course-related information is available in the language of the degree programme and is accessible for anyone involved.

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

With regards to the module descriptions, the University submits a revised syllabus in which the mistakes concerning the credit points have been corrected. The peers also see that the online module descriptions have been updated, as they now also include the intended learning outcomes. However, they still do not include the responsible persons for each module or recommended literature. The peers are of the opinion that this information should be added to the module descriptions. The University provides a separate document in which all modules and the respective assessment methods are listed. The University notes that due to the COVID-19 pandemic and changes affecting the national higher education system, the document may require some adjustment in the near future. The peers note that the document seems to include all modules in all study programmes provided by the University, and that these modules are not listed in any apparent order. Furthermore, the document is unclear on the extent to which the grade for each module consists of the listed assessment methods, and whether other elements such as attendance factor in. The peers find this document difficult to navigate and are of the opinion that the information should be integrated in the programme's module descriptions provided online, which are clearer and better structured.

The University submits an English-language diploma supplement. The peers note that numerous paragraphs are highlighted in yellow and that this should be removed before the diploma supplements are distributed to students. Otherwise, they consider the diploma supplement to be satisfactory.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- On-site discussions
- Survey results
- Self-assessment report
- Notes of Improvement council meetings

Preliminary assessment and analysis of the peers:
The University explains that the quality assessment and development in the CMI programme is subject to two QM systems, the CMI/Figure QM system and the university's QM system. The peers note during the discussions with the programme coordinators that the University has not supplied an overview of the University's QM system, the University indicates that an overview will be submitted after the audit.

The CMI/Figure QM system must be implemented by all universities that operate a CMI programme. To fulfil the CMI requirements, the CMI GA programme has implemented an "Improvement council" which includes representatives from students, teaching staff, programme coordinators and industry. The programme coordinators and teachers also explain that there are meetings between the teachers and students every semester, during which the students can bring up general programme issues as well as issues pertaining to specific modules.

In addition, all students are given the opportunity to participate in annual evaluations of the programme. The University provides the results of these evaluations along with the self-assessment report. During the discussions, the peers are informed that the evaluations take place once a year and include all students in the Applied Geology programmes, including non-CMI students. They aim to cover all aspects of the programme. However, there are no questions pertaining to the performance of individual teachers, as this is prohibited by French law. Also, as the evaluations are anonymous, it is not possible to distinguish between the results of the regular programme and those of the CMI programme.

The peers note that a general evaluation in which the results of the regular and CMI GA programmes are mixed is of limited use for the continuous development of the CMI programme, particularly since the desired learning outcomes, workload and teaching methods of the CMI programme differ from those of the regular programme. For this reason, the

University must implement evaluations specific to the CMI GA programme, which only include CMI GA students and therefore will allow the staff to draw useful conclusions relating to the CMI GA programme's specific features.

During the discussions with the alumni and industry representatives, the peers also learn that the University sends the alumni questionnaires to obtain information about their professional development. The University also surveys industry partners to determine the types of skill profiles they require. The panel is therefore able to confirm that the University collects information on how the student qualifications are accepted on the labour market.

After reviewing the survey results and following the discussions with the students, the peers conclude that the students are generally satisfied with the staff and programme leadership and consider them to be responsive to their needs. This is facilitated by the small number of students in the programme, which allows the teachers to interact with students on a more personal level. The peers believe that the regular informal interaction between teachers and students benefits the continuous development of the programme, but note that some students may prefer to provide feedback in a more formal feedback session. For this reason, the peers suggest that the University formalizes its "semester" feedback sessions, by for instance distributing a copy of the results and implemented changes to all students.

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

The University provides a document detailing the internal criteria by which study programme quality should be assessed. Furthermore, the University provides a link to the website of its quality support service (DAQ), composed of 2 agents which support faculties with accreditation processes. The DAQ offers tools (guides, input tables, methodological assistance, etc.) and sets up specific workshops or training for educational transformation. The peers are thereby satisfied that internal quality management structures exist.

With regards to evaluations for the CMI programme students, the University does not provide any comment. As previously noted, the peers are of the opinion that the university must implement separate evaluations for the students in the CMI programme.

With regards to the semester feedback sessions, the University does not provide any comment. The peers stand by their previous recommendation that these should be formalized and conducted specifically for the CMI Applied Geology programme participants.

D Additional Documents

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

D 1. Sample Diploma of the Programme
D 2. English-language Diploma supplement
D 3. Explanation and list of examples how the programme fulfills the EUR-ACE criterion Engineering Design
D 4. Overview of University's QM System including binding responsibilities and mechanisms (see ASIIN criterion 6)

E Comment of the Higher Education Institution (20.08.2020)

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

- Internal evaluation process
- Explanation and list of examples of how the CMI GA programme fulfils the EUR-ACE Engineering design criterion
- Diploma Supplements in English and French
- Revised syllabi in English and French
- Sample diploma

F Summary: Peer recommendations (04.09.2020)

Taking into account the additional information and the comments given by the 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 accreditation
CMI Applied Geology	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 5.1) Ensure the module descriptions include responsible persons and information about the components of the module grade.

A 2. (ASIIN 6) Ensure that the CMI Applied Geology programme is evaluated separately from the regular Earth Sciences Bachelor and Applied Geology Master programmes.

Recommendations

E 1. (ASIIN 3) It is recommended to give students who fail a semester a second chance in the CMI programme.

E 2. (ASIIN 5.2) It is recommended to provide students with more group project rooms.

E 3. (ASIIN 6) It is recommended to formalize the “semester” feedback sessions between staff and students and conduct these sessions specifically for the CMI students.

G Comment of the Technical Committees

Technical Committee 03 - Civil Engineering, Geodesy, Architecture (07.09.2020)

The Technical Committee discusses the procedure. Regarding the wordkload of the students the committee determines a peak with 42 ECTS-Points in the second semester. In particular at the beginning of the study programe it seems to be a very high workload for students. Therefore, the committee proposes an additional recommendation to distribute the workload more equal to the semesters.

Intensively the committee discusses the award of the EUR-ACE label. It can see that students get in-depth knowledge and understanding of the mathematics and other basic sciences (physics, chemistry, earth sciences) underlying their specialisation in geoengineering. Additionally, they get knowledge and understanding in the fields of underground engineering, mining and drilling engineering as technical base for geoengineering. Out of the curriculum the committee can see that students will be able to analyse new and complex engineering products, processes and systems and to select and apply the most appropriate and relevant methods in the fields of geotechnics (civil engineering), hydrology (geothermal) and mineral resources (mining, exploration).

In the question whether students are able to develop and to design new engineering processes and systems the committee follows the assessment of the peers. In general, the committee could see that students get the opportunity for designing technical solutions for geological issues during their studies. Regarding the intensity of these qualifications the committee follows the assessment of the peers which is based on the revision of exams and final theses. The positive review of the peers is confirmed for the committee by their discussion with companies and former graduates of the programme in which it was mentioned that the capability of the graduates to analyse, design and develop complex products, processes and systems was decisive to get employed. For the committee this shows that graduates of the programme are working as engineers successfully.

The Technical Committee 03 – Civil Engineering, Geodesy, Architecture recommends the award of the EUR-ACE Label as follows:

Degree Programme	ASIIN seal	Subject-specific Label	Maximum duration of accreditation
CMI Applied Geology	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 5.1) Ensure the module descriptions include responsible persons and information about the components of the module grade.

A 2. (ASIIN 6) Ensure that the CMI Applied Geology programme is evaluated separately from the regular Earth Sciences Bachelor and Applied Geology Master programmes.

Recommendations

E 1. (ASIIN 2.4) It is recommended to distribute the workload more equal to the semesters.

E 2. (ASIIN 3) It is recommended to give students who fail a semester a second chance.

E 3. (ASIIN 5.2) It is recommended to provide students with more group project rooms.

E 4. (ASIIN 6) It is recommended to formalize the “semester” feedback sessions between staff and students and conduct these sessions specifically for the CMI students.

Technical Committee 11 - Geosciences (09.09.2020)

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

The Technical Committee 11 – Geosciences recommends the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific Label	Maximum duration of accreditation
CMI Applied Geology	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 5.1) Ensure the module descriptions include responsible persons and information about the components of the module grade.

A 2. (ASIIN 6) Ensure that the CMI Applied Geology programme is evaluated separately from the regular Earth Sciences Bachelor and Applied Geology Master programmes.

Recommendations

E 1. (ASIIN 3) It is recommended to give students who fail a semester a second chance in the CMI programme.

E 2. (ASIIN 5.2) It is recommended to provide students with more group project rooms.

E 3. (ASIIN 6) It is recommended to formalize the “semester” feedback sessions between staff and students and conduct these sessions specifically for the CMI students.

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. It agrees with the findings of Technical Committee 03 and adapts its recommendation with regards to spreading the workload more evenly across the semesters. In all other respects it agrees with the findings of the expert panel.

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 03 Civil Engineering.

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

Degree Programme	ASIIN seal	Subject-specific Label	Maximum duration of accreditation
CMI Applied Geology	With requirements for one year	EUR-ACE®	30.09.2025

Requirements

A 1. (ASIIN 5.1) Ensure the module descriptions include responsible persons and information about the components of the module grade.

A 2. (ASIIN 6) Ensure that the CMI Applied Geology programme is evaluated separately from the regular Earth Sciences Bachelor and Applied Geology Master programmes.

Recommendations

E 1. (ASIIN 2.4) It is recommended to distribute the workload more equally across the semesters.

E 2. (ASIIN 3) It is recommended to give students who fail a semester a second chance in the CMI programme.

E 3. (ASIIN 5.2) It is recommended to provide students with more group project rooms.

E 4. (ASIIN 6) It is recommended to formalize the “semester” feedback sessions between staff and students and conduct these sessions specifically for the CMI students.

I Fulfilment of Requirements (17.09.2021)

Analysis of the peers and the Technical Committees

A 1. (ASIIN 5.1) Ensure the module descriptions include responsible persons and information about the components of the module grade.

Initial Treatment	
Peers	Fulfilled. Justification: the revised module descriptions now contain the information and have been published on the University website.
TC 03	Fulfilled Vote: unanimous Justification: The Technical Committee discusses the procedure and follows the assessment of the peers without any changes.
TC 11	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 discusses the procedure and follows the assessment of the peers and technical committees without any changes.

A 2. (ASIIN 6) Ensure that the CMI Applied Geology programme is evaluated separately from the regular Earth Sciences Bachelor and Applied Geology Master programmes.

Initial Treatment	
Peers	Fulfilled. Justification: the revised module descriptions now contain the information and have been published on the University website.
TC 03	Fulfilled Vote: unanimous Justification: The Technical Committee discusses the procedure and follows the assessment of the peers without any changes.
TC 11	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 discusses the procedure and follows the assessment of the peers and technical committees without any changes.

Decision of the Accreditation Commission (17.09.2021)

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

J 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 degree programme:

	Thematic grouping	Code	Description
			Disciplinary skills
Disciplinary skills	Related Sciences (CD1.SC)	CD1.1SC	To know the fundamental principles of ecosystem organization
		CD1.2SC	To master the fundamental concepts of mathematics, chemistry and physics applied to the Earth Sciences.
		CD1.3SC	Process analytical data using mathematical, statistical and computer tools
		CD1.4SC	Assess the uncertainty and accuracy of field and laboratory data
	Fundamental Concepts in Geoscience (CD2.G)	CD2.1G	Mastering the fundamental concepts of geological processes
		CD2.2G	Mastering rock and mineral characterization tools
		CD2.3G	Characterize geological objects at all scales to analyze their origin and deduce their applications.
		CD2.4G	Represent the spatial geometry of geological objects at different scales (design a geological map, a geological section, make a stereographic projection, a 3D representation, etc.).
	Field Practice (CD3.T)	CD3.1T	Describe geological objects in the field
		CD3.2T	Performing measurements from the most common field scientific instruments in the Earth Sciences
		CD3.3T	Synthetizing point field data to produce map models
		CD3.4T	Define a sampling strategy
		CD3.5T	Synthetizing point field data to produce geological alea maps
	Laboratory Acquisition and Interpretation of Geological Data (CD4.ID)	CD4.1ID	Know the main laboratory instruments, how they work and their fields of application in the earth sciences.
		CD4.2ID	Use the most common scientific laboratory equipment in Earth Sciences
		CD4.3ID	Exploit and interpret results of chemical, mineralogical, petrographic and petrophysical analyses
		CD4.4ID	Interpret geological data (sedimentological, petrological, structural, geophysical and hydrogeological)
	Geological Models (CD5.M)	CD5.1M	Linking several types of data (analytical and/or field data) in order to design a conceptual map.
		CD5.2M	Design geological conceptual models
		CD5.3M	Applying analog and digital geological modelling tools

	Specific practice CD6.GA	CD6.1GA	Characterize the mechanical properties of a soil using scientific geotechnical equipment
		CD6.2GA	Apply geomechanical and geotechnical calculations
		CD6.3GA	Recommend geotechnical solutions
		CD6.4GA	Planning an active water resources management program
		CD6.5GA	Diagnose and plan a remediation program for polluted sites and soils
		CD6.6GA	Assessing drinking water resources and their quality
		CD6.7GA	Plan a land search strategy
		CD6.8GA	Develop a research strategy to determine the conditions for the formation of deposits
		CD6.9GA	Defining prospecting guides and delineating the extension of a deposit
		CD6.10GA	Estimating the reserves of a deposit
		CD6.11GA	Sizing a geomaterial processing plant
			Pre-professional skills
Pre-professional skills	Role within organizations (CP1.R)	CP1.1R	To situate one's mission within an organization in order to adapt and take initiatives.
		CP1.2R	Setting priorities, managing your time autonomously
		CP1.3R	Respect the principles of ethics, deontology and environmental responsibility.
		CP1.4R	Coordinate a team
	Positioning in the socio-economic world (CP2.P)	CP2.1P	To characterize and value one's identity, skills and professional project according to a context.
		CP2.2P	Taking a step back from a situation, self-evaluating and questioning oneself in order to learn.
		CP2.3P	Understanding economic, organizational and managerial issues
		CP2.4P	Identify and locate the professional fields potentially related to the training achievements.
	Project Management CP3.G)	CP3.1G	Implement and comply with procedures, legislation and standards in the fields of applied geology
		CP3.2G	Writing any form of technical or scientific writing (response to calls for tender, study reports, articles)
		CP3.3G	Assessing the context of a project, defining objectives
		CP3.4G	Evaluating and carrying out actions to be implemented on a project
			Transversal and linguistic skills
Transversal and linguistic skills		CT1	Report and communicate orally and in writing, adapting to the public concerned (professionals, general public, academics, etc.).
		CT2	Perform a literature search and master computerized bibliographic applications.
		CT3	Analyze and synthesize data for evaluation.
		CT4	Develop an argumentation with a critical mind.

		CT5	Easily use the different registers of written and oral expression of the French language.
		CT6	Use written and oral comprehension and expression easily in at least one foreign living language (English compulsory).
		CT7	Using numerical tools to format scientific data
		CT8	Apprehend complex problems with a spirit of synthesis and critical analysis

The following **curriculum** is presented:

ACRONYM	Semester 1	ECTS		
VT1SVMA	Mathematics (OM1)	2	30 ECTS	BA-CHELOR 1
VT1SVPH	Physics	3		
VT1SVCH	Chemistry	3		
VT1SVTU	The Earth and the Universe since the Big Bang	6		
VT1YSVDE	Diversity and evolution of life	3		
VT1YSVEC	Organization of ecological systems	3		
VT1SVBI	Cell Biology	4		
VT1SVLA	English S1	3		
VT1DP1	OSEC 1	3		
ACRONYM	Semester 2	ECTS		
VT2TEOMA	Mathematical tools (OM2)	3	30 ECTS	
VT2TEPH	Wave physics and electromagnetism (PHOND)	3		
VT2TECH	Chemistry STerre 1	4		
VT2GESTR	Structural Geology	2		
VT2NET	Nature of the earth's envelopes (NET)	6		
VT2CARTO	Methodology, cartography and terrain (carto)	6		
VT2TELA	English S2 Sterre	3		
VT2STAT	Statistical tools (OS)	3		
VTI1MPC	Complements Maths/Physics/Chemistry-CMI	3	12 ECTS CMI	
VT2YDP2	OSEC 2	3		
	Immersion internship in a CMI company	3		

VTI1PJ	Engineering Initiation Project	3		
ACRONYM	Semester 3	ECTS		
VT3PH?	Physics of Continuous Media (PMC1)	4	30 ECTS	
VT3TEOMA	Mathematical Tools (OM3)	2		
VT3MIGCH	Mineralogy - Geochemistry	6		
VT3CRIGE	Crystallography and geochemistry	3		
VT3DACH	Natural Radioactive Data and Analytical Chemistry in Geosciences	3		
VT3CART	Land and cartography	6		
VT3DP3	OSEC DP3	3		
VT3TELA	English S3 Earth	3		
VT3ESE3	OSEC ESE 3	3	8 ECTS CMI	
VTI2TEPJ	Research Initiation Project	2		
VTI2GE1A	Applied Geology 1A CMI	3		
ACRONYM	Semester 4	ECTS		BACHELOR 2
VT4TEOMA	Mathematical tools (OM4)	2	30 ECTS	
VT4CHSTE	S-chemistry. Earth 2	2		
VT4GEOPH	Geophysics	2		
VT4EESED	Outer shells and sedimentology	6		
VT4STRPA	Stratigraphy and Paleontology (Stratipal)	6		
VT4CART	Cartography in sedimentary terrain (Carto)	6		
VT4TEOIN	Computer tools (info tool)	2		
VT4TEOMR	Opening to the world of research 1	2		
VT4TELA	English	2		
VT4YDP4	OSEC 4	3	4 ECTS CMI	
VTI2OMR	Opening to the world of research 2	1		
ACRONYM	Semester 5	ECTS		BACHELOR 3
VT5PETRO	Endogenous petrology 1 (petro endo 1)	6	30 ECTS	
VT5TERR	Field practice / integrative project	6		
VT5TECTO	Deformation and microtectonics	6		

VT5CARBO	Carbon chemistry	1		
VT5PALEO	Paleoclimatology	2		
VT5ETCAS	Skills Development - Case Study	3		
VT5PH?	Physics of Continuous Media (PMC2)	2		
VT5GEA	Applied Geology 2	2		
VT5TELA	English	2		
VT5ESE1	OSEC 5	3	6 ECTS CMI	
VTI3MRE	IJC Research Methodology	3		
ACRONYM	Semester 6	ECTS		
VT6GEFRA	Geology of France	4		
VT4YHTER	History of the land (Hister)	2		
VT6GEDYN	Geodynamic models (Geodyn)	3		
VT6GEA	Applied Geology 3	3		
VT6PETRO	Endogenous petrology 2 (Petro endo 2)	6		
VT6CARTO	School of Base Mapping	6	30 ECTS	
VT6TELA	English S6 Land	2		
VT6TELAI	English S6 Land CMI	1		
VT6TESG	Internship in the laboratory or in a company	2		
VT6TEASG	Around the Course	1		
VTI3OSEC3	OSEC 6	3	6 ECTS CMI	
VTI3TEPJ	CMI Geoscience Project	3		
ACRONYM	Semester 7	ECTS		
VT7GESTR	Structural geology and rock mechanics	6		
VT7TERR	Field school	6		
VT7GESUR	Surficial geology	6	30 ECTS	MAS-TER 1
VT7HYDRO	Hydrogeology and Hydrodynamics	6		
VT7MESOL	Elements of soil mechanics	6		
	OSEC DP7	3	6 ECTS CMI	
VTI4DOGE	Observation/acquisition/processing of geophysical data	3		

ACRONYM	Semester 8	ECTS		
VT8GEOM	Geomatics and Geostatistics	3		
VT8GELA	English	3		
VT8GECE	corporate culture 1 (law)	3		
VT8GEOPH	Applied Geophysics	3		
	Specialization in AM: 1 EU among 3 :	6	30 ECTS	
VT8HYDRO	choice 1: Hydrogeology 1			
VT8GECON	choice 2: Construction geotechnics 1			
VT8METAL	choice 3: Mineral Resources 1 (Metallogeny)			
VT8GESG	Specialization internship (6 months alternating)	12		
	OSEC 8	6	6 ECTS CMI	
ACRONYM	Semester 9	ECTS		
VT9HYDEN	Environmental Hydrogeology	6		
VT9GEGC	Civil Engineering Geology	6		
VT9YMGTE	Geological modelling	6		
VT8GEOM	Mandatory GIS sub-unit	3		
VT9YMHYD	Choice 1 Hydrodynamic modeling	3		
VT9YMG3D	Choice 2 3D geological modeling	3		
VT9YMGTE	Choice 3 geotechnical modelling	3	30 ECTS	MAS-TER 2
VT9GEMAT	Geomaterials	4		
VT9RISQ	Natural risk management	2		
	Specialization in AM: 1 EU among 3 :	6		
VT9HYAPP	choice 1: Applied Hydrogeology			
VT9OMINE	choice 2: mining operations			
VT9GETEC	choice 3: Construction geotechnics 2			
VTI5LA	English	3	6 ECTS CMI	
	OSEC 9	3		
ACRONYM	Semester 10	ECTS		
VT0GECE	Corporate culture 2 (law and accounting)	3	30 ECTS	

VT0GELA	English	3		
VT0GEPJ	Framed project - Integrator project	6		
VT0GESG	Internship (7 months) lab or business. (alternation)	18		
	Communication in Geosciences	3	6 ECTS CMI	
VTI5RISQ	Risks and Companies	3		