TEACHING AND EXAMINATION REGULATIONS (TER)

2019-2020

In accordance with article 7.13 of the [Dutch] Higher Education and Research Act [WHW]

MASTER DEGREE PROGRAMME
CIVIL ENGINEERING
&
MASTER DEGREE PROGRAMME
APPLIED EARTH SCIENCES
&
4TU MASTER DEGREE PROGRAMME
CONSTRUCTION MANAGEMENT AND ENGINEERING

TU Delft Delft University of Technology

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Paragraph 1 - General

Article 1 – Applicability of the regulations[1]

1. These regulations including the programme specific annexes, apply to the teaching and the examinations of the Master degree programme in Civil engineering, the Master degree programme in Applied Earth Sciences and the Interfaculty 4TU Master degree programme Construction Management and Engineering, hereinafter referred to as 'the programme' or 'programmes'.

2. The programmes are provided under the responsibility of the Faculty of Civil Engineering and Geosciences at Delft University of Technology, hereinafter referred to as the 'faculty'.

Article 2 – Definitions of terms used

The following concepts apply in this Regulation:

a.	Act:	the Higher Education and Scientific Research Act (in Dutch, the WHW), Dutch Bulletin of Acts, Orders and Decrees, number 593 and as amended since;
b.	academic year	the period from 1 September till 31 August of the following calendar year;
c.	annex (former: IR)	the appendix which forms part of these Teaching and Examination Regulations;
d.	Board of Examiners:	the programme's Board of Examiners, which has been installed in accordance with Article 7.12 of the Act;
e.	bridging programme:	a deficiency rectifying programme aimed at moving up to a Master degree programme, while enrolled in a Bachelor degree programme, but without obtaining a Bachelor degree, as stipulated in Article 7.30e or Article 7.57i of the Act;
f.	cohort:	the group of students who have registered for a degree programme for the first time in a given academic year;
g.	course (or: 'subject'):	a teaching unit within the programme as intended in Article 7.3, sections 2 and 3 of the Act; a subject can consist of a number of components;
h.	credit:	a European Credit (EC) awarded in line with the European Credit Transfer System (ECTS); one credit denotes a study load of 28 hours;
i.	(component) partial examination:	an assessment of the knowledge, insight and skills of a student in relation to a component within a subject, as well as the marking of that assessment by at least one examiner, appointed for that purpose by the Board of Examiners;
j.	degree:	an academic title conferred by universities and colleges as an indication of the completion of a course of study, or as an honorary recognition of achievement (here: MSc in Civil Engineering);
k.	degree audit:	the evaluation, in which, in accordance with Article 7.10 of the Act, the Board of Examiners determines whether all examinations in the subjects of the degree programme have been successfully completed;
l.	disability:	all conditions which are (at least for the specified period) chronic or lasting in nature and which form a structural limitation for the student in receiving education and/or sitting examinations or taking part in practicals;
m.	education registration system:	the current education registration system is Osiris;
n.	examination:	an assessment of the knowledge, insight and skills of a student in relation to a subject, as well as the marking of that assessment by at least one examiner, appointed for that purpose by the Board of Examiners;
o.	examiner:	the individual who, in line with Article 7.12, Subsection 3 of the Act, has been appointed by the Board of Examiners to set the examinations;
p.	institute:	Delft University of Technology;
q.	interim examination:	the assessment of the examinee's knowledge, insight and skills and the results of the assessment as referred to in Section 7.10, first subsection of the WHW;
r.	learning management platform	the current learning management platform is Brightspace;
s.	practical exercise:	subject or component of a subject aimed at the acquisition of particular skills. The following can be understood as practical exercises: • writing a thesis, • conducting a project or experimental design, • carrying out a project or a design/research assignment, • conducting a literature review, • completing an internship, • participating in fieldwork or an excursion, • conducting tests and experiments, or

[1] These Teaching and Examination Regulations (TER) are drafted per academic year and are valid as of the first day of the relevant academic year. This TER replaces all previous versions of the TER.

		• participating in other educational activities that are considered essential and that are aimed at enabling participants to attain certain skills;
t.	programme:	the Master degree courses (Civil Engineering) as stipulated in Article 7.3a Paragraph 1, Subsection b of the Act;
u.	programme duration:	the duration starting from the enrolment of the student up and to including the last examination;
v.	student:	a person enrolled at Delft University of Technology in order to receive education and take the examinations and the degree audit in the degree programme;
w.	study guide:	a digital guide to the programme containing specific information pertaining to the various subjects;
x.	teaching period:	half a semester;
y.	track	major, as stipulated in Article 7.13, Paragraph 2, Subsection b of the Act;
z.	virtual learning environment:	the electronic system designed for the exchanging of teaching information;
aa.	working day:	Monday to Friday with the exception of recognised national public holidays and the collective closure days.

2. The other concepts in these regulations are used in the sense in which they appear in the Act.

3. In these regulations, the term 'examination' also refers to 'interim or partial examination', with the exception of Articles 19, section 1, first complete sentence and 22.

Paragraph 2 - Admission and prior education

Article 3a – Admissions to the Master degree programme

1. Individuals holding one of the following degrees have access to the education of the Master degree programme in Civil Engineering (under a) or Applied Earth Sciences (under b) or Construction Management Engineering (under c) on the condition that all of the stated requirements have been met.

   a. Civil Engineering
   - Bachelor degree from Delft University of Technology or from University of Twente.

   b. Applied Earth Sciences
   - Bachelor degree "Technische Aardwetenschappen" or "Applied Earth Sciences" from Delft University of Technology.

   c. Construction Management and Engineering
   - Bachelor degree Bouwkunde/Architecture from Delft University of Technology or from Eindhoven University of Technology,
   - Bachelor degree Civiele Techniek/Civil Engineering from Delft University of Technology or University of Twente,
   - Bachelor degree Technische Bedrijfskunde from Eindhoven University of Technology or from University of Twente,
   - Bachelor degree Technische Bestuurskunde/Systems Engineering, Policy Analysis and Management from Delft University of Technology,
   - Bachelor degree in Innovation Sciences from Eindhoven University of Technology.

   Depending on the Bachelor degree, certain synchronisation courses are mandatory according to the annex of the programme.

2. Students who do not possess the degree mentioned in section 1 are required to obtain proof of admission to the programme from the dean, who will seek the advice of the admission committee on this matter:

   a. Other university Bachelor degree (not including those listed in section 1)
   The following applies to this category:
   Successful completion of the stated bridging programme for admission to the Master degree programme:

   For Civil Engineering and Applied Earth Sciences:
   - University Bachelor degree
   Bridging programme to be followed: to be specified upon application.

   For Construction Management and Engineering:
   - University Bachelor degree: students who do not possess any of the degrees mentioned in section 1 may be eligible for, and should therefore seek advice on, a possible tailor-made bridging program.

b. Higher professional education degree
The following applies to this category:
Successful completion of the stated bridging programme for admission to the Master degree programme and, if applicable, the language requirement
- higher professional education degree [Dutch higher vocational institute (HBO)]

For Civil Engineering and Applied Earth Sciences:
Bridging programme to be followed: Transitional programme for students with a Dutch higher vocational institute Bachelor degree ("HBO") as stipulated in the annex.

For Construction Management Engineering:
- University Bachelor degree: students who do not possess any of the degrees mentioned in section 1 may be eligible for, and should therefore seek advice on, a possible tailor-made bridging program.

c. Foreign degree
This category is subject to the general selection requirements of Delft University of Technology with regard to prior foreign education, based on a Cumulative Grade Point Average of at least 75% of the maximum number of points that could be earned, included in the table of countries (see website) and meeting the requirements for satisfactory linguistic mastery of English, as stated in the annex of art. 3.

3. For admission in accordance with section 2, the following additional condition apply:
   Access to the education of the Master degree programme in Civil Engineering, Applied Earth Sciences and Construction Management Engineering is open to individuals who have demonstrated to the admissions committee that they possess knowledge, insight and skills at the level of the Bachelor degree mentioned in section 1.

4. All students are also subject to the following qualitative admission requirements:
   In order to obtain proof of admission, the student must meet or, as the case may be, possess:
   a. the general relevant criteria set by the Executive Board, laid down in the "Policy on fees and enrolment", laid down in Annex 1 of the Student Charter (central part), and clarified in Part 1.2 "Entrance and admission" of the mentioned Student Charter.
   b. a certificate, together with the accompanying list of marks, proving that he/she possesses knowledge of a sufficiently high level and broad scope to successfully complete the programme within the allotted period.

Article 3b – Admission to the bridging programme

1. In order to be admitted to the bridging programme, the student must satisfy the general relevant criteria set by the Executive Board in the "Policy on fees and enrolment", laid down as annex 1 of the Student Charter (main part), and clarified in Chapter 2 "Entrance and admission" of the mentioned Student Charter.

2. The criteria mentioned in section 1 are elaborated further in the annex of the specific programme.

Article 3c – Completion of bridging programme prior to the degree programme

1. A student who is enrolled in a Bachelor degree programme for a bridging programme with the aim of being admitted to the Master degree programme at TU Delft, must complete this bridging programme within two academic years. Deviations from the bridging programme are not allowed.

2. After the programme duration of the bridging programme the enrolment of the student will be cancelled. Under exceptional circumstances the student can submit a well-founded request for an extension of the course duration for a period of at most twelve months.

3. The Executive Board will set the tuition fee to be charged, as denoted in Article 7.57i of the Act, for the enrolment as student in a bridging programme and for the extension thereof, as denoted in Subsection 2 of this article.

4. A well-founded request for extension must be submitted to the Board of Examiners. The Board of Examiners can decide to grant extension of the programme duration when a student is experiencing or has experienced a study delay due to circumstances that are beyond the student's control.

Article 4 - Not applicable

Paragraph 3 - Content and composition of the programme

Article 5 – Goal of the programme

1. The programmes intend to educate students to earn a Master of Science in Civil Engineering respectively in Applied Earth Sciences or Construction Management and Engineering, whereby the final attainment levels described below must be achieved, providing them with such a level of knowledge, insight and skills in the area of Civil Engineering, Applied Earth Sciences or Construction Management and Engineering, that graduates can fulfil positions on the labour market at the Master's level.

2. Graduates must also meet the specific final attainment levels for each degree programme as listed below:
   1. be capable of being analytical in their work, on the basis of a broad and deep scientific knowledge;
   2. be able to synthesise knowledge and to solve problems in a creative way when dealing with complex issues;
   3. possess the qualities needed for employment in circumstances requiring sound judgement, personal responsibility and initiative, in complex and unpredictable professional environments;
   4. be able to assume leading roles, including management roles, in companies and research organisations, and be able to contribute to innovation;
   5. be able to work in an international environment, helped by their social and cultural sensitivity and language and communication abilities, partly acquired through experience of team work and any study periods abroad;
   6. possess an awareness of possible ethical, social, environmental, aesthetic and economic implications of their work and the insight to act accordingly;
   7. possess an awareness of the need to update their knowledge and skills.

In addition, Master of Science graduates should possess the following competences:
   1. required core knowledge and understanding in their field of study;
   2 knowledge of methods and technical practice in their field of study;
   3. training in theoretical knowledge and methods, including modelling;
   4. advanced knowledge of specific areas in their field of study;
   5. specific attitude and way of thinking expected in a particular subject;
   6. awareness of connections with other disciplines and ability to engage in interdisciplinary work.

The programme-specific requirements are listed in the annex to article 5 of the specific programmes.

Article 6 – Track and annotations

1. The Master degree programme in Civil Engineering has the following tracks, with the stated content in the annex:
   - Building Engineering
   - Environmental Engineering
   - Geo-engineering
   - Geoscience and Remote Sensing
   - Hydraulic Engineering
   - Structural Engineering
   - Transport & Planning
   - Water Management

Double track
A student can opt to study two tracks within the Master Degree Programme in Civil Engineering, for which the criteria are stipulated in the annex.

Within a track or within a specialisation the student may (partly) opt for the annotations, mentioned in the annex:
   - Technology in Sustainable Development
   - Entrepreneurship
   - Urban Planning and Engineering
   - Integral Design and Management
   - Railway Systems
   - Dynamics of Structures

2. The Master degree programme in Applied Earth Sciences has the following tracks, with the stated content in the annex:
   - Geo-Energy Engineering
   - Geo Engineering
   - Geoscience and Remote Sensing
   - Environmental Engineering
   - Applied Geophysics

- European Mining, Minerals and Environment
  - *specialisation*: European Mining Course (EMC)

Within a track or within a specialisation the student may opt for the annotations, mentioned here and here (or see the annex of the MSc Civil Engineering):
- Technology in Sustainable Development
- Entrepreneurship

3. The Master Degree Programme CME has no tracks.
   Within the Master degree programme in Construction Management and Engineering students may choose the annotation of which the specifics can be found in the annex of the MSc Civil Engineering:
   - Integral Design and Management
   - Entrepreneurship
   - Urban Planning and Engineering

Article 7 – Composition of the programme and degree audits

1. The programme includes the Master degree audit, with a study load of 120 credits.

2. Following approval from the two Boards of Examiners concerned, a student may take an individual double degree programme in which two Master programmes are combined simultaneously to create a programme of at least 180 credits. Upon completion the student is awarded two Master diplomas. The student must earn at least 60 unique credits for each Master degree programme.

3. Courses that were part of the Bachelor degree programme that qualified a student for admission to the Master degree programme may not be included in the Master degree programme. If a compulsory component has already been completed in the aforementioned Bachelor degree programme, the Board of Examiners will designate an alternative course. If an elective course of the degree programme has already been completed in the aforementioned Bachelor degree programme, the student will select an alternative elective course.

4. The Master degree audit is concluded with an MSc thesis, a final test or assignment. The MSc thesis, final test or assignment demonstrates that the student possesses and is able to apply the knowledge, insight and skills acquired in the degree programme.

5. The degree programme is described in the annex of the specific MSc programme, along with the courses and subjects, including the study load, number of contact hours and form of examination of each course, as well as the programming of the examination and the language.

6. The actual design of the education is elaborated in greater detail in the study guide.

Article 8 – Form of the programme

The degree programmes are offered exclusively on a full-time basis.

Article 9 – Language

1. The teaching is in English, and the examinations, practical exercises and degree audits are administered in English.

2. Under exceptional circumstances only, a student can apply for an exemption with the Board of Examiners from taking the examination in Dutch, if it can be demonstrated that this would be to the benefit of the student.

Article 10 – Honours Programme

1. Based on the criteria referred to in the Master's Honours Programme, students will be selected and admitted to the Master's Honours Programme by the Director of Studies/an Honours Coordinator or an Honours Committee established by the Director of Studies.

2. The Master's Honours Programme comprises at least 20 credits.
   a. At least five credits must be completed in the institution-wide component of the Master's Honours Programme: the subject 'Critical Reflection on Technology' (UD2010),
   b. At least 15 credits must be completed in the faculty component of the Master's Honours Programme, the composition of which (including its content and options) is described in the Honours Programme.

3. All students selected for participation in the Honours Programme must submit their options for the faculty component to the director of studies, the Honours coordinator or Honours committee for approval.

4. The Board of Examiners will be responsible for assessing whether all the requirements of the Master's Honours Programme have been met.

5. Any student who has successfully completed the Master's Honours Programme will be awarded a certificate signed by the chair of the Board of Examiners and the Rector Magnificus.

Article 11 – (Compulsory) participation in the programme

1. All students are expected to have participated actively in the courses for which they are examined.

2. If necessary, there will be an obligation to participate in practical exercises, with a view to admission to the related examination. The Board of Examiners has the authority to grant an exemption from this obligation, and can require a substitute requirement.

3. Any supplementary obligations are described by component in the study guide.

Article 12 - Programme evaluation

1. The Director of Studies is responsible for the evaluation of the education.

2. The manner in which the education in the programme is evaluated is documented in a separate document, that is presented to the Faculty Student Council and the Board of Studies.

3. The Director of Studies informs the Board of Studies concerning the outcomes of the evaluation, the intended adjustments based on these outcomes and the effects of the actual adjustments.

Paragraph 4 – Registration and withdrawal for courses and examinations[2]

Article 12a – Compulsory registration for courses

1. All students must register each semester for every course that they wish to or are obliged to take, subject to the further provisions of this article. Students must register for each course in the education registration system (Osiris).

2. Students who have not registered for a course according to the prescribed procedure are excluded from participation in that course.

3. Students who are participating for the first time in the first year of a Bachelor, Master or Bridging programme will be registered by the faculty for all compulsory courses in the first semester of the first academic year of the programme. The procedure for registering for electives for these students who are registering for the first time is described in the study guide.

4. Registration for courses takes place each semester during the registration period described below. Note that the registration period for a course with limited capacity as referred to in Section 6 of this article is one week shorter.
   a. The registration period for courses in the first semester is
      - from Monday (9:00) of teaching week 4.6 up to and including Sunday (23:59) of teaching week 4.7, and
      - from Monday (9:00) up to and including Sunday (23:59) of teaching week 4.2 for a course as referred to in Section 6 of this article.
   b. The registration period for all courses in the second semester is
      - from Monday (9:00) of teaching week 2.3 up to and including Sunday (23:59) of teaching week 2.4, and
      - from Monday (9:00) up to and including Sunday (23:59) of teaching week 2.1 for a course as referred to in Section 6 of this article.

   Two weeks after the closing of the registration period a first check will take place based on the entry requirements described in the study guide. The registration for students who fulfil the entry requirements at the time of the check is finalised. If students do not meet the entry requirements at that time, they will be given the opportunity to meet the entry requirements if possible.

[2] Please note: articles 12a and 12b will be applicable to students CEG and CME from September 2020 onwards.

One week before the start of the semester, a second and final check will take place. The registration for students who fulfil the admission requirements at the time of this check is finalised. Students who do not fulfil the admission requirements at the time of this check will not be permitted to participate in the course.

5. Students may register for courses with a total maximum study load of 40 credits per semester. A student who wishes to take more courses must submit a written request for this, giving their reasons, to the Director of Education of the faculty before the registration period as referred to in subsection a or b in section 4 of this Article, after first seeking advice from the academic counsellor. If permission for this is granted, the programme will arrange the registration for the extra course(s).

6. Before the start of the registration period the study guide will show which courses or parts of courses are a compulsory part of the programme. The Programme Director may restrict participation in a course within a programme in the following cases:

a. for a course with a maximum number of participants, admission is based on the criteria stated in the study guide, on the understanding that priority will be given to students for whom the course is a compulsory part of their programme.

b. for a course with an admission requirement, registration for the course is seen as a pre-admission which will be checked against the admission requirements stated in the prospectus before being finalised.

c. if participation in an elective is subject to further requirements as stated in the course description in the study guide.

7. Students who wish to register for a course outside of the official registration period on the grounds of exceptional personal circumstances may send a written request to Director of Education up to two weeks before the start of the semester, giving their reasons for this.

8. If a student has taken a course (or part of a course) for which an assessment will be given, without having registered for this course correctly or on time, any given assessment is invalid. The student may submit a written request to the Board of Examiners asking for a valid assessment and explaining their reasons. The Board of Examiners will only honour such a request in the event of exceptional circumstances.

9. Registration for a course does not count as registration for an examination. Students must register for examinations separately in accordance with the relevant provisions.

Article 12b – withdrawal from a course

1. Students may withdraw from a course at any time, via the education registration system (Osiris). Such a withdrawal is final.

2. A student who has withdrawn from a course and wishes to take it at a following opportunity must re-register for the course in accordance with the provisions of Article 12a.

Article 13 - Registration for written examinations

1. Registration to participate in a written examination is compulsory and is done by entering the requested data into the education registration system (Osiris) no later than 14 calendar days before the examination. Students receive examination tickets by email as confirmation of their registration.

2. Students who have not registered within the term specified in Section 1 may request registration for that examination after this term until no later than three calendar days before the examination by entering the requested data into the education registration system (Osiris). The request will be honoured providing that places are available in the room or rooms where the examination is scheduled to take place. Students receive examination tickets by email as confirmation of their registration.

3. In the event of circumstances beyond a student's control resulting in the student being unable to register for an examination, the Board of Examiners may nevertheless permit the student to participate in the examination.

4. Students who have not registered for the examination and are therefore not included on the list of examinees can report on the day of the examination to the invigilator beginning 15 minutes before the start of the examination until the actual start. They will be admitted to the examination room, in the order that they reported to the invigilator, 30 minutes after the start of the examination, if sufficient places are available. The loss of 30 minutes of examination time cannot be compensated. Students who have been granted late access to the examination will be added to the list of examinees. The student participates in the examination subject to the validation of entitlement to participate in the examination.

5. In the situation described in the previous section, if it is found that a student was not entitled to participate in the examination, the examination work will be deemed invalid, it will not be marked and it will not count towards a result. The student may subsequently submit an appeal to the Board of Examiners, accompanied by reasons, requesting that the examination work that

has been deemed invalid be declared valid and to have it assessed. The Board of Examiners will approve the request only in case of extenuating circumstances.

Article 14 - Registering for other examinations and practicals

1. Registration for participation in an examination other than a written examination and/or practicals is compulsory, and will take place in the manner and by the deadline indicated in the study guide or for additional information on the virtual learning environment (Brightspace) or in the annex of the TER for the relevant examination.

2. In special cases, the Board of Examiners may deviate from the period of registration referred to in section 1, however only in favour of the student.

3. Students who have not registered on time will not be allowed to participate in the examination and/or practicals. In exceptional circumstances the Board of Examiners may allow the student to participate in the examination and/or practicals.

4. In the event of unauthorised participation in an examination and/or practicals, the Board of Examiners may declare the result invalid.

Article 15 - Withdrawal

1. Students can withdraw from an examination through the education registration system (Osiris) up to three calendar days before the examination.

2. Any student who has withdrawn from an examination should re-register on a subsequent occasion, in accordance with the provisions of Articles 13 and 14.

Paragraph 5 – Examinations

Article 16 - Form of the examinations and the manner of testing in general

1. Examinations are taken in the manner (oral, written or otherwise) described in the study guide.

2. The study guide of the specific programmes contains a description of the moments at which and the numbers of times that examinations can be taken, along with their frequency, without prejudice to the provisions of these regulations concerning written and oral examinations.

3. A student may participate in an examination for a course no more than twice in one academic year.

4. In special cases, the Board of Examiners may deviate from the provisions of the above sections in favour of the student.

5. Ultimately two weeks before a written examination, the examiner will give the students the opportunity to familiarise themselves with examples of examination questions and answers.

Article 17 – Times and number of written examinations

1. Two opportunities to take written examinations will be offered each academic year:
   - the first opportunity is during or at the end of the teaching period in which the course is taught,
   - the second opportunity is in the fifth week or at the end of the next teaching period, except for courses taught in the fourth and last quarter of the academic year for which the second opportunity is during the resit period in the months July and August, unless otherwise stated in the study guide. Both opportunities need to be offered in the same academic year the course is taught in.

2. A timetable of all the opportunities for sitting written examinations is drawn up on an annual basis and distributed before the start of the relevant semester.

3. If there is no indication as to the number of times a particular examination can be taken in any one academic year because it relates to a course not taught by the programme itself, the relevant stipulations in the Teaching and Examination Regulations of the other programme will apply. The Board of Examiners reserves the right to make decisions that deviate from the norm regarding this matter.

4. Contrary to the provisions of section 1, for discontinued courses two opportunities to sit an examination will be offered after the academic year in which the course was last taught. Both opportunities are in the academic year following the one in which the course was last taught

5. In exceptional cases, the Board of Examiners may permit more than two opportunities in a year for certain examinations.

Article 18 – Oral examinations

1. For oral examinations, no more than one student shall be tested at a time, unless determined otherwise by the examiner.

2. Oral examinations shall be public, except in special cases in which the Board of Examiners has decided otherwise, or if the student has filed an objection to the public nature of the examination.

3. The oral examination is administered by at least two examiners.

4. Prior to an oral examination, the examiner must ask the student(s) to provide proof of identity.

Article 19 – Determination and announcement of results

1. The examiner determines the result of a written examination as quickly as possible but by no later than 15 working days after the examination. The results of written interim examinations shall be announced no later than five working days before the next written interim examination.

2. The examiner determines the result of an oral examination immediately after it is administered and issues the student with a written statement of this result.

3. The examiner records the results of the assessment of a practical exercise as quickly as possible, but in principle no later than 15 working days after the completion of the practical exercise at the designated time. In the education registration system (Osiris), the result will be dated on the date of completion of the practical exercise. With regard to a series of practical exercises in which the knowledge acquired in a previous practical exercise is important to the subsequent practical exercise, the result of the previous practical exercise shall be announced before the subsequent practical exercise. If this is not possible, the examiner shall schedule a timely discussion of the previous practical exercise.

4. The examiner is responsible for the registration and publication of the results in the education registration system (Osiris), with observance of the student's privacy. When the result of an examination is announced, the student is informed about the right of perusal as stipulated in Article 20 as well as about the possibility of appealing to the Examinations Appeals Board.

5. Contrary to the previous provisions, results achieved in the resit period in August shall be registered and published no later than the last working day of the week following the examination week in August.

6. If special circumstances prevent the examiner from registering the results on time, the examiner will report this to the Board of Examiners, accompanied by reasons, and notify the students and student administration as quickly as possible.

Article 20 – Right to inspect the results

1. Upon request, students will have the right to inspect their assessed work during a period of 20 working days after the announcement of the results of a written examination or the assessment of a practical exercise. Students intending to appeal against the assessment of their work will be issued with a copy of the assessed work.

2. During the period mentioned in section 1, all students who have participated in the examination can become acquainted with the questions and assignments of the relevant examination, as well as with the standards that form the basis of the assessment.

3. The examiner can determine that the inspection intended in sections 1 and 2 will take place at a pre-established place and at a pre-established time.

4. Students proving that they were unable to appear at such an established place and time because of circumstances outside of their control will be offered another possibility, if possible within the period mentioned in section 1. The place and times mentioned in the first sentence will be made known in good time.

Article 21 – Discussion of the results of examinations

1. Students who have taken a written examination or who have received the assessment of a practical exercise can ask the relevant examiner for a discussion of the results during a period of 20 working days after the announcement of the results. The discussion will take place within a reasonable period, at a place and time to be determined by the examiner.

2. At the request of the student or at the initiative of the examiner, a discussion justifying the assessment will take place between the examiner and the student as soon as possible after the announcement of the result of an oral examination.

3. If a collective discussion is organised by the examiner, students may submit requests as referred to in the last section only if they have been present at the collective discussion, or if they were unable to be present at the collective discussion because of circumstances outside their control.

4. The Board of Examiners may allow deviation from the provisions of sections 2 and 3.

Article 22 – Period of validity of examinations

1. The period of validity of the results of an examination is indefinite. The dean can restrict the period of validity of a successfully completed examination only if the knowledge or insight that was examined has become outdated or if the skills that were examined have become outdated.

2. In cases involving a limited period of validity based on section 1, the period of validity shall be extended at least by the duration of the acknowledged delay in studies, based on the TU Delft Profiling Fund Scheme.

3. In individual cases involving special circumstances, the Board of Examiners can extend periods of validity that have been limited based on section 1 or further extend periods of validity that have been extended based on section 2.

4. The provisions of section 1 likewise apply to partial examinations, unless the validity of the partial examination is linked to a time period stated in the study guide.

Article 23 - Exemption from an examination or obligation to participate in a practical exercise

1. After having obtained recommendations from the relevant examiner, the Board of Examiners may grant exemptions to students:
   a. who have successfully completed an examination or degree audit in a system of higher education within or outside the Netherlands that corresponds to the examination for which the exemption has been requested in terms of content and level, or
   b. who demonstrate that they possess sufficient knowledge and skills that have been acquired outside the system of higher education.

2. After having obtained recommendations from the relevant examiner, the Board of Examiners may grant exemption from the requirement to participate in a practical exercise with a view to admission to the related examination, possibly subject to alternative requirements.

Article 24a - Periods and frequency of degree audits

In principle, the opportunity to take the Master's degree audit will be offered once each month. The dates for the meetings of the Board of Examiners shall be published before the beginning of the academic year.

Article 24b – invalidation of examinations

The Board of Examiners is authorised to declare invalid an examination or an examination component, if a correct assessment of the knowledge, insight and skills of the student has been proved reasonably impossible, based on the examination or that component. The Board of Examiners may draw up further rules for this.

Paragraph 6 - Studying with a disability

Article 25 – Adjustments to the benefit of students with disabilities or chronic illnesses

1. Upon a written and substantiated request to that effect, students with disabilities or chronic illnesses may be eligible for adjustments in teaching and examinations. These adjustments are coordinated to the situations of the students as much as possible, but they may not alter the quality or level of difficulty of a subject or the study programme. Facilities to be provided may include modifications to the form or duration of examinations and/or practical exercises to suit individual situations or the provision of practical aids.

2. Requests as mentioned in section 1 must be accompanied by a recent statement from a physician or psychologist or, in cases involving dyslexia, from a testing office registered with BIG, NIP or NVO. If possible, this statement should include an estimate of the extent to which the condition is impeding the student's academic progress.

3. Decisions concerning requests for adjustments relating to educational facilities are taken by the dean or by the Director of Studies on the dean's behalf. Decisions concerning adjustments relating to examinations are taken by the Board of Examiners.
4. Adjustments to examinations can involve the following or other matters:
- form (e.g. replacing a written test with an oral test or vice versa, testing the required material in the form of interim examinations or granting exemptions to the attendance requirement);
- timing (e.g. additional time for an examination, or a change to the distribution of examinations across the examination period, granting exemptions to admission requirements or extending the period within which a component must be completed);
- aids permitted during testing (e.g. English-Dutch dictionaries for students with dyslexia);
- location (taking the examination in a separate, low-stimulus space).

5. Adjustments in educational facilities could include:
- providing modified furniture in teaching and examination spaces;
- providing special equipment (e.g. magnification or Braille equipment for students with visual impairments and blindness or loop systems and individual equipment for students with hearing impairments and deafness);
- providing more accessible course material;
- providing special computer facilities (e.g. speech-recognition or speech-synthesising software);
- providing a rest area.

Paragraph 7 – Study support and (binding) recommendation on the continuation of studies

Article 26 – Study support and Monitoring of student progress

1. The dean is responsible for providing individual study supervision to students registered for the degree programme, partly for their orientation towards potential study options within and outside the degree programme. He will also ensure that effective support and supervision is provided to students in making choices related to their studies.

2. The examination and study programme applying to each student is documented in the education registration system (Osiris).

3. The Student Administration is responsible for ensuring that all students are able to review and check their results in the education registration system (Osiris).

Article 27 – Not applicable.

Paragraph 8 - Final provisions

Article 28 – Conflicts with the regulations

In the case of conflict between provisions in the study guide or other document concerning the relevant teaching and examination education and study programme and these regulations, the provisions of these regulations shall take precedence.

Article 29 – Amendments to the regulations

1. Amendments to these regulations are adopted separately by the dean.

2. Amendments that are applicable to the current academic year will be made only if they would not reasonably damage the interests of students.

3. Amendments to these regulations may not lead to disadvantageous changes to any decisions that have been made with regard to individual students.

Article 30 – Transitional regulations

1. If the composition of the degree programme undergoes substantive changes, transitional measures will be established and published through the dean.
   Transitional measures can be found in the (annex of the) TER of the cohort involved.

2. These transitional measures shall include at least the following:
   a. an arrangement regarding exemptions that may be obtained based on examinations that have already been passed;
   b. the period during which the transitional arrangement shall be valid.

3. Students shall follow the degree programme as it applied or applies during the first academic year of their enrolment, unless components of the programme are no longer offered. In such cases, students must transfer according to the applicable transitional measures. Deviations require the approval of the Board of Examiners. Before submitting a request to this end, the student must have first obtained recommendations from an academic counsellor.

4. If a course within a degree programme is cancelled, four opportunities for taking the examination in this subject shall be offered after it has been taught for the last time: the examination at the end of the teaching of the course, a resit in the same academic year and two resits in the following academic year.

Article 31 – Announcement

1. The dean is responsible for ensuring a suitable announcement of these regulations and any amendments to them.

2. In any case, the Teaching and Examination Regulations are to be posted on the programme's website.

Article 32 – Entry into force

These Regulations shall enter into force on 1 September 2019.

Adopted by the dean of the faculty on 27 June 2019.

ANNEX to Article 3 of the TER

Language level for individuals holding a higher professional education degree (c)

The English language, through the successful completion of one of the following tests:
- A TOEFL iBT (Test of English as a Foreign Language internet-Based Test) with an overall band score of at least 90 or
- an IELTS (academic version) with an overall Band score of at least 6.5 or
- a proof of completion of the 'Certificate of Proficiency in English' (CPE) or the 'Certificate in Advanced English' (CAE), both of the University of Cambridge. Only the following certificates are accepted:
    - C1 Advanced (Certificate of Advanced English) with an overall minimum score of 176.
    - C2 Proficiency (Certificate of Proficiency in English) with an overall minimum score of 180.

  Certificates that are older than two years on the day you have uploaded the document and completed your application are not accepted.

Certificates must have been completed successfully before the start of the bridging programme.

The following candidates shall be exempted from the requirement to pass an English language test:
- Nationals from the USA, UK, Ireland, Australia, New Zealand or Canada
- Applicants with a Dutch Pre-university (VWO) certificate
- Applicants who have obtained a higher professional education degree in the USA, U.K., Ireland, Australia, New Zealand and Canada.

Language level for individuals holding a foreign degree (d)

The English language, through the successful completion of one of the following tests:
- A TOEFL iBT (Test of English as a Foreign Language internet-Based Test) with an overall band score of at least 90 and a minimum score of 21 for each section, or
- an IELTS (academic version) with an overall Band score of at least 6.5 and a minimum score of 6.0 for each section, or
- a proof of completion of the 'Certificate of Proficiency in English' (CPE) or the 'Certificate in Advanced English' (CAE), both of the University of Cambridge. Only the following certificates are accepted:
    - C1 Advanced (Certificate of Advanced English) with an overall score of 176 and a minimum of 169 for each section.
    - C2 Proficiency (Certificate of Proficiency in English) with an overall score of 180 and a minimum of 169 for each section

Certificates older than two years on the day you have uploaded the document and completed your application are not accepted.

The following candidates shall be exempted from the requirement to pass an English language test:
- Nationals from the USA, UK, Ireland, Australia, New Zealand or Canada.
- Applicants who have obtained a Bachelor's degree in one of the countries mentioned.

Annex

2019-2020

MASTER OF SCIENCE
APPLIED EARTH SCIENCES

TER annex is applicable to students cohort 2019-2020

TU Delft Delft University of Technology

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Paragraph 1 – Compiling the study programme

Article 1 – The study load

The study load for the Master's degree course is 120 credits. None of the components of the course may have formed part of the Bachelor's degree course in Applied Earth Sciences.

Article 2 – Tracks, specialisations and annotations

1. The course comprises the following tracks:
   - Geo-Energy Engineering, as laid down in Article 4
   - Geo-Engineering, as laid down in Article 5A
   - Geoscience and Remote Sensing, as laid down in Article 5B
   - Environmental Engineering, as laid down in Article 5C
   - Applied Geophysics, as laid down in Article 6
   - European Mining, Minerals and Environmental, as laid down in Article 7 Specialisation:
     - European Mining Course (EMC)

2. Within a track or within a specialisation the student may opt for the annotations, mentioned in Articles 8 and 9:
   - Technology in Sustainable Development
   - Entrepreneurship.

Article 3 – Registering the tracks and compiling the examination programme

1. At the start of the programme the students need to register their track in My Study Planning and determine their examination programme in cooperation with the relevant MSc-track coordinator.

2. Prior to the start of the Final Thesis students need to present their examination programme together with the title, a short abstract, a time schedule and the chairman and members of the assessment committee of the Final Thesis for approval. In case the examination programme satisfies the rules as laid down in this annex then it can be approved by the MSc-track coordinator only; in case the programme does not satisfy the rules as laid down in this annex, then it also needs to be approved by the Board of Examiners, with a motivation for the deviation from these Regulations.

3. Any amendments made to the previously approved examination programme or to the previously approved assessment committee should be presented to the MSc-track coordinator and in the case of the program not satisfying the rules as laid down in this annex also to the Board of Examiners for final approval, with a motivation for the deviation from these Regulations.

4. Students who opt for the annotations Technology in Sustainable Development or Entrepreneurship need the approval of their examination programme from the referee of the chosen annotation prior to presenting their examination programme to the MSc-track coordinator and/or Board of Examiners according to section 2 and 3 of this article.

Article 4 – Rules for choosing electives

The student may choose:
- all subjects offered in conjunction with the degree course,
- all subjects offered in conjunction with other Master's degree courses at a Dutch university or at an international university which TU Delft has an exchange contract with,
- an internship (CIE4040-09, 10 EC), Additional Thesis (AES4011-10), Research project (CIE4061-09, 10 EC) or Multidisciplinary Project, Civil Engineering Consultancy project (CIE4061-09, 10 EC)
- interfaculty Master's-level electives at Delft University of Technology with a "WM-code" to a maximum of 6 credits, however language, skills subjects and MOOCs are **not** allowed within the examination programme. Language, skill subjects and MOOCs can only be part of the extracurricular section of the diploma supplement.[1]

[1] This means that subjects like writing, oral presentation, English and Dutch are not allowed within the examination programme

Examinations pertaining to subjects given by other programmes are to be completed in the way stipulated by or on behalf of the Teaching and Examination Regulations laid down by the relevant programme.

Article 5 – The Geo-Energy Engineering track

1. The study programme of the Geo-Energy Engineering track is compiled in the following way:

- track-linked compulsory core programme
  93 credits, laid down in subsection 2
- electives:
  45 credits as laid down in subsection 3

2. Compulsory core programme Geo-Energy Engineering:

code	subject	ECs
AESM1305	Geo-Energy Engineering Challenge	12
AESM1315	Energy Transition	3
AESM1320	Geology for Geo-Energy	5
AESM1325	Physics for Geosystems	5
AESM1330	Forward and Inverse Geomodelling	5
AESM1470	Field Lab	3
AESM2305	Geo-Energy Engineering Project	15
AESM2310	MSc Thesis	45

3. The following electives are offered within the Geo-Energy Engineering track:

code	subject	ECs
AESM1400	Geothermal Energy	3
AESM1405	Petroleum Exploration and Production	3
AESM1410	Subsurface Storage	3
AESM1415	Effects of subsurface Engineering	3
AESM1420	Advanced Sedimentary Geology	3
AESM1425	Geomechanics and Structural Geology	3
AESM1440	Multiphase Flow in Porous Rocks	3
AESM1445	Dynamic Modelling and Optimization	3
AESM1450	Geophysical Prospecting	3
AESM1430	Simulation and Building of Stratigraphy	3
AESM1435	Production Science and Technology	3
AESM1460	Reservoir Characterisation and Petrophysics	3
AESM1465	Geological Interpretation of Geophysical Data	3
AESM1455	Numerical Methods for Subsurface Geoscience Simulation	3
AESM1475	Outcrop Geology for Subsurface Characterization	3

From the total of 45 EC of electives the student is required to take a total of 27 EC, with the added requirement that the student takes at least two courses from category 1 and one from each of the other categories:

Category 1	AESM1400 Geothermal Energy, AESM1405 Petroleum Exploration and Production, AESM1410 Subsurface storage and AESM1415 Effects of subsurface engineering.
Category 2 [3]	AESM1420 Advanced Sedimentary Geology, AESM1430 Simulation and Building of Stratigraphy, AESM1435 Production Science and technology, ~~AESM1450 Geophysical Prospecting~~ and AESM1425 Geomechanics and Structural Geology.
Category 3	AESM1440 Multiphase Flow in Porous Rocks, AESM1445 Dynamic Modelling and Optimization, AESM1450 Geophysical Prospecting ~~AESM1410 Subsurface Storage~~ and AESM1455 Numerical Methods for Subsurface Geoscience Simulation.
Category 4	AESM1460 Reservoir Characterization and Petrophysics, AESM1465 Geological Interpretation of Geophysical data, and AESM1475 Outcrop Geology for Subsurface Characterization

Article 6 – The Geo-Engineering track

1. The study programme for the Geo-Engineering track consists of:
- a common compulsory Geo-Engineering block
  74 credits, laid down in subsection 2
- Geo-Engineering electives
  adding up to a total of 100 track-linked credits, as laid down in subsections 2 and 3

[3] Adjustment dd September 13, 2019

- electives
  20 credits, as laid down in subsection 4.

2. Common compulsory block Geo-Engineering

All students opting for the track Geo-Engineering must complete the following subjects adding up to 74 credits:

code	subject	ECs
AESM1630-19	Engineering Geology	5
CIE4361	Behaviour of Soils and Rocks	6
CIE4365-16	Modelling Coupled Processes for Engineering Applications	5
CIE4366	Numerical Modelling in Geo-Engineering	6
CIE4395	Risk and Variability in Geo-Engineering	4
CIE5321	Experimental Methods in Geotechnical Engineering	5
AESM1700	Consolidation of Soils	3
AESM2606	Final Thesis Geo-Engineering	40

3. Geo-Engineering electives

If the Bachelor's phase did not include WM0325TA, Technics and Responsibility, students shall choose one out of two:

CIE4510	Climate Change: Science and Ethics	4
WM0312CIE	Philosophy, Technology Assessment and Ethics	4

If the Bachelor's phase did not include the contents of the following subjects, these subjects are compulsory on the advice of the master coordinator:

code	subject	ECs
AES1730[4]	Introduction to Geotechnical Engineering *for students without a background in soil mechanics and geotechnical engineering*	3
CIE4420[5]	Geohydrology 1 *for students without geohydrology background*	4
AESM4370	Introduction to Geology *for students with a Civil Engineering background*	1
CIE4370-19	Introduction to Structural Mechanics *for students with an Applied Earth Science background*	2

Students are required to complete a selection of the following subjects adding up to a total of 100 track-linked credits.

code	subject	ECs
AES1640-11	Environmental Geotechnics	4
AES1720-11	Rock Mechanics Applications	5
AESM2901-16	Geoscience and Engineering Fieldwork	10
CIE3109-09	Structural Meachnics 4	4
CIE4353	Continuum Mechanics	6
CIE4362	Soil-structure Interaction	3
CIE4363	Deep Excavations	4
CIE4367-16	Design of Embankments	3
CIE4390	Geo-risk Management	3
CIE4780	Trending Topics in Geo-Engineering	4
CIE5305	Bored and Immersed Tunnels	4
CIE5340-18	Soil Dynamics	4
CIE5741	Trenchless Technologies	4
OE44030	Offshore Geotechnical Engineering	4

4. Electives

Choose two out of:

code	subject	ECs
Any Master's degree course subject Applied Earth Sciences or Civil Engineering		10
Free	Master of Science electives	10

Other courses than the ones listed for the specialisation part may be acknowledged as an elective only after consultation with and explicit approval of the chair of the graduation committee.

[4] Not for students who passed CTB2310 (Soil Mechanics) or an equivalent course.
[5] Not for students who passed CTB3390, AESB3340 or an equivalent course.

Article 7 – The Geoscience and Remote Sensing track

1. The study programme for the Geoscience and Remote Sensing track consists of:
   - a common compulsory Geoscience and Remote Sensing block
     73 credits, as laid down in subsection 2
   - Geoscience and Remote Sensing electives
     27 track-linked credits, as laid down in subsection 3
   - electives
     20 credits, as laid down in subsection 4.

2. Common compulsory block Geoscience and Remote Sensing
All students opting for the track Geoscience and Remote Sensing must complete the following subjects adding up to 73 credits:

code	subject	ECs
CIE4510[5]	Climate Change: Science & Ethics	4
CIE4601	Physics of the Earth and Atmosphere	5
CIE4603-16	Geo-signal Analysis	6
CIE4604	Simulation and Visualization	5
CIE4606	Geodesy and Remote Sensing	5
CIE4611	Geo-measurement Processing	5
CIE4615	GRS Fieldwork	3
AESM2640	Final Thesis Geoscience and Remote Sensing	40

3. Geoscience and Remote Sensing electives
Students are required to complete a selection of the following subjects adding up to a total of 27 credits.

Choose at least 12 credits out of:

code	subject	ECs
CIE4522-15	GPS for Civil Engineering and Geosciences	4
CIE4602	Cryosphere: remote sensing and Modelling	4
CIE4605	Atmospheric Turbulence	4
CIE4607	Ocean topography and sea-level change	4
CIE4608	Atmospheric Remote Sensing	4
CIE4609	Geodesy and Natural Hazards	4
CIE4610	Gravity, Geodynamics and Climate Change	4
CIE4614-18	3D Surveying of Civil and Offshore Infrastructures	4

and choose adding up to a total of 27 credits out of:

code	subject	ECs
CIE4612	Research Seminar Geoscience and Remote Sensing II	1
CIE5601	Advanced topics in Geoscience and Remote Sensing	3
CIE5602	Research Seminar Geoscience and Remote Sensing I	1
CIE5603	Advanced Project on GRS	3
CIE5604	Journal club on climate change and geoscience	3
AE4890-11	Planetary sciences I	4
GEO1002	Geographical Information Systems (GIS) and cartography	5

Any Master's degree course subject Applied Earth Sciences or Civil Engineering.

[5] Not compulsory if Bachelor's phase did include WM0325TA Technics and Responsibility

4. Electives

Choose two out of:

code	subject	ECs
Any Master's degree course subject	Applied Earth Sciences or Civil Engineering	10
Free	Master of Science electives	10

Article 8 – The Environmental Engineering track

The Environmental Engineering track has two specialisations:
- Environmental Technology
- Environmental Science

The compulsory programme for each specialisation consists of a common compulsory Environmental engineering block of 21 credits and 4 credits compulsory Ethics course. Depending on your specialisation profile you have an additional block of 36 credits (Environmental Technology) or 34 credits (Environmental Science).

Common compulsory block Environmental Engineering

All students opting for the track Environmental Engineering must complete the following subjects adding up to 21 credits:

code	subject	ECs
CIE4701	Transport processes in Environmental Science and Engineering	4
CIE4495-13	Fundamentals of Water Quality and Treatment	4
CIE4440	Hydrological Processes and Measurements	4
CIE4702	Integrated Project: Leapfrog Environmental Degradation	4
CIE4365-16	Modelling Coupled Processes for Engineering Applications	5

All students must complete the compulsory Ethics course of 4 credits:

CIE4510	Climate change: Science & Ethics	4

In addition to the presented programme students must meet the following requirements:
Students who have not done Python or Matlab modelling in the Bachelor's phase must take "CIE2001WO Computer programming BSc Bridging" as an elective subject[6].

AESM2650	Final Thesis Environmental Engineering	40

Additional block Environmental Technology

Students who have opted for the specialisation Environmental Technology must complete the following subjects adding up to 36 credits:

code	subject	ECs
CIE4703	Water Treatment	6
CIE4704	Chemical Conversations in Environmental Engineering	5
CIE4705	Environmental Biotechnology & Microbiology	6
CIE4710	Materials separation in Waste Processing	5
CIE5421	Water and Health	4
CIE5704	Water Treatment Research	5
CIE5702	Conceptual Process design	5

Additional block Environmental Science

Students who have opted for the specialisation Environmental Science must complete the following subjects adding up to 34 credits:

code	subject	ECs
CIE5450	Hydrology of Catchments, Rivers and Deltas	4
CIE4707	Air Quality	5
CIE4706	Introduction into Meteorology	5
CIE4709	Remote Sensing for Environmental Monitoring	5
CIE4708	Water in the Atmosphere	5
CIE5703	Urban Climate & Hydrology	5
CIE5701	From Field Observations to Modelling	5

[6] Students who have not done Introduction to water Treatment in the Bachelor's phase are strongly advised to take CIE3365 Introduction to Water Treatment as an elective subject.

Environmental Engineering electives

All subjects listed above and not part of the chosen specialisation can be chosen as electives. In addition other electives can be chosen as specified in article 3A. Students who have opted for the specialisation Environmental Technology can choose electives with a minimum of 19 credits. Students who have opted for the specialisation Environmental Science can choose electives with a minimum of 21 credits.

Article 9 – The Applied Geophysics track

The Applied Geophysics programme is taught at three partner universities:
- TU Delft
- ETH Zürich
- RWTH Aachen

The study programme is compiled in the following way:

First year

Delft

A minimum of 25 credits should be passed from TU Delft subjects, whereby all three of the following blocks must be passed:
- Field Geophysics and Signal Analysis with Matlab/Python Exercises: AESM1511
- Electromagnetic Methods: AES1540-11
- Seismic Wave Propagation and Imaging: AES1560.

code	subject		ECs
AES1540-11	Electromagnetic Exploration Methods		6
AES1550-06	Geophysics Special Subjects		6
AES1560	Advanced Reflection Seismology and Seismic Imaging		6
AESM1590-18	Seismic Acquisition to Data Information Content	6	
AESM1320	Geology for Geo-Energy	6	
AESM1511	Field geophysics and signal analysis with exercises		6
CIE4606	Geodesy and Remote Sensing		5

Zürich

A minimum of 25 credits should be passed from the ETH Zürich subjects, whereby two of the following three blocks must be passed:
- Reflection seismology processing: 651-4079-00L
- Geophysical Fieldwork and Processing: 651-4104-00L and 651-4106-03L
- Modelling and Inverse Theory for Appleid Geophysics: 651-4094-00L and 651-4096-00L.

code	subject	ECs
651-4079-00L	Reflection Seismology Processing	6
651-4087-00L	Case Studies in Engineering and Environmental Geophysics I	3
651-4087-02L	Case Studies in Engineering and Environmental Geophysics II	3
651-4094-00L	Numerical Modelling for Applied Geophysics	3
651-4094-02L	Numerical Modelling for Applied Geophysics II	3
651-4096-00L	Inverse Theory for Applied Geophysicists	3
651-4096-02L	Inverse Theory for Applied Geophysicists II	3
651-4104-00L	Geophysical Fieldwork and Processing: Methods	2
651-4106-03L	Geophysical Field Work and Processing: Preparation + Field Work	7
102-0448-00L	Groundwater II	6
701-0106-00L	Mathematics V: Applied Deepening of Mathematics I – III	3

Second year

Aachen

A minimum of 25 credits should be passed from the RWTH Aachen subjects, whereby two of the following five blocks must be passed:
- Geophysics Special Methods: 16ws-29463 and 16ws-14238
- Geophysical Logging and Log Interpretation: 16ws-14570
- Geothermics: 16ws-13943
- Hydrogeophysics and Data Analysis in Geoscience: 16ws-18482 and 16ws-18162
- Numerical Reservoir Engineering + Numerical Methods and Programming: 16ws-42235 and 16ws-42487

code	subject	ECs
16ws-18667	Applied Structural Geology	3
16ws-29463	Geophysics special Methods: NMR	3
16ws-14238	Geophysics Special Methods: Spectral IP	3
16ws-14570	Geophysical Logging and Log Interpretation	5
16ws-13943	Geothermics	5
16ws-18482	Hydrogeophysics	3
16ws-18162	Data Analysis in Geoscience	3
16ws-18598	Mineral Exploration (if Energy Resources Management not taken)	3
16ws-32124, 23301	Petroleum System Modelling/Sedimentary Basin Dynamics	6
16ws-29469	Engineering Geophysics	3
16ws-33690, 16689	Remote Sensing of Sedimentary Basins	3
16ws-24349	Planning-Realization-Optimization in Geo-resources Management	3
16ws-24537	Prospect Evaluation and Risk Analysis	3
16ws-45471	Portfolio Management	3
16ws-24346	Energy Resource Management (if Mineral Exploration not taken)	3
16ws-42235	Numerical Reservoir Engineering: Geophysics, Uncertainties and optimal experimental Design	3
16ws-42487	Numerical Methods and Programming for Reservoir Engineering	3
16ws-14775	Introduction to scientific Computing Languages	6
16ws-24760	Microstructural Analysis	6
16ws-12379	Einführung in Geographische Informationssysteme (GIS)	3
153ss-00086	Coal Geology	3
16ws-47549,47550	Numerical Methods for Geophysical Flows	3
16ws-00220,28046	Finite Elements in Fluid Dynamics	3

Delft/Aachen/Zürich

code	subject	ECs
AESM2506	Final Thesis Applied Geophysics	30

Article 10 – The European Mining, Minerals and Environmental track

European Mining Course

The specialisation European Mining Course (EMC), as laid down in this subsection, is taught at three partner universities:

- Helsinki University of Technology
- RWTH Aachen
- TU Delft

The study programme of the specialisation European Mining Course (EMC) is compiled

in the following way: First year

1st semester: Helsinki

code	subject	ECs
CHEM-E6140	Fundamentals of Minerals Engineering and Recycling	5
CHEM-E6225	Technical Innovation Project	10
GEO-E2030	Rock Mechanics	5
GEO-E3010	Economic Geology & Mineral Economics	5
GEO-E3020	Field Experience and Project in Hard Rock Mining	5

2nd semester: Aachen

code	subject	ECs
17ss-49733	Feasibility Studies, Project Management and Financial Modelling	5
17ss-49767	Reserve Modelling and Estimation	4
17ss-49735	Underground Mine Design	4
17ss-49769	Surface Mine Design	4
17ss-49732	Mine Ventilation	6
Choose option 1:		
17ss49768	Case StudyUnderground Mining Project	7

OR		
Choose option 2:		
17ss-49734	Case Study – Surface Mining Project	7

Second year

3rd semester: Delft

code	subject	ECs
AESM1023	Computer aided mine design and optimization	5
AESM1024	Legal, Health and Safety	5
AESM1025	Data Analysis and resource modelling	5
AESM2022	Project execution and mine start-up planning	10
AESM2300-1	Investment Scenarios	1
CME2300	Financial Engineering	4

4st semester :

code	subject	ECs
AESM2010	Final Thesis	30

Article 11 – Internship

1. Before the internship commences, an internship agreement has to be closed between the internship coordinator, the examiner from the relevant subject area, the supervisor at the company or institution where the student is doing the internship, and the student.

2. The internship agreement must at least detail the aims and contents of the practical training period.

3. The learning objectives stated in the study guide, form the basis for the assessment. The period of training will be assessed in its entirety.

4. For the assessment of internships, the learning objectives stated in the study guide form the basis. The study guide should indicate the assessment method, including the weighing of components as well. The subject area examiner will determine whether the report meets the requirements laid down for the structure and production of the report as well as the student's own assessment of the internship. The company or institution supervisor will also be consulted.
   The subject area examiner will determine the final mark, also on the basis of the recommendations made by the company or institution supervisor. In the case of large differences between the conclusions of the subject area examiner and the recommendations of the company or institution supervisor, the internship coordinator determines the final mark.

5. The official date of the completion of the internship will be the date on which the final report is submitted.

Article 12 – Multidisciplinary Project, Civil Engineering Consultancy Project

1. In the Multidisciplinary Project, Civil Engineering Consultancy Project manual an indication is given of the number of phases into which a project is divided.

2. The first phase must be rounded off with a work plan that has to be approved by the supervisory team after the initial assessment. If the work plan is not approved then a supplement must be added. The project cannot be pursued until the work plan has been approved.

3. Roughly mid-way through the second phase there will be a briefing when the group will be expected to present the results and the activities still to be carried out to the supervisory team.

4. At the beginning of the third phase the group will submit the draft final report.

5. The last phase will be rounded off with the production of the final report and a summary of that same report. Subsequently, during the final assessing, there will be an oral presentation of the final report and an evaluation report will be produced.

6. The student is expected to attend the initial assessment, the briefing and the final assessment and to be present at any other point deemed necessary by the supervisory team. If a student has no valid excuse for being absent at such times then the student can be banned from further participating in the project.

7. The work plan and the final report must be assessed by at least two examiners, one of whom must be the main supervisor.

8. When it comes to the final assessment, the work aspects definitely taken into consideration will be the following:
   a. the quality of the final topic
   b. how the various sub-topics have been integrated.
   c. written reporting
   d. oral presentation
   e. the group process
   The learning objectives stated in the study guide form the basis for the assessment. The study guide should indicate the assessment method, including the weighing of components as well.

9. In case of group work, the group result will also be the individual final result unless the main supervisor has sound reason to deviate from that in the case of one or more students in the group.

10. The group is responsible for ensuring that there is regular contact with the main supervisor, especially in instances where the project is being completed abroad.

11. The projects, carried out in one course year, are to be evaluated by one of the concerned examiners, who will report to the Director of Education.

12. The official date of the completion of a project will be the date on which the final report or project is submitted or the date on which the oral final presentation is given.

It is not allowed to start the Multidisciplinary Project, Civil Engineering Consultancy Project until the student has completed the BSc.

Article 13 – Additional Graduation Work, Research Project

1. The Additional Graduation Work, Research Project should be distinguishable from the normal Master Thesis Project.

2. For the assessment the additional thesis, the learning objectives stated in the study guide form the basis. The study guide should indicate the assessment method, including the weighing of components as well. In case of group work, the group result will also be the individual final result unless the main supervisor has sound reason to deviate from that in the case of one or more students in the group.

3. The Additional Graduation Work, Research Project must be assessed by at least two examiners from the academic staff at Delft University of Technology. One of them, being a professor, an associate professor, an assistant professor or lecturer in the Civil Engineering or Applied Earth Science Master programme, is responsible for the assessment and determines the grade only after close consultation of the other examiner. The examiner who is responsible for the assessment has a UTQ or is active in acquiring it. At least one of the two examiners must have a permanent position.
   When the Additional Graduation Work, Research Project is assessed the following aspects will be taken into consideration. The final mark will be determined using the additional thesis grading sheet.
   a. Scientific approach:
      - theoretical profundity
      - state of the art description and literature study
      - scientific argumentation
      - quality of experimental work and design
      - creativity
   b. Quality of result:
      - scientific reflection and judgment
      - utilization of result
      - extension of methods
      - quality of abstract
      - amount of work
   c. Behavioral competencies
      - initiative
      - responsibility
      - communicative skills
      - independency
      - time planning

d. Quality of written presentation
   - structure and consistency
   - acknowledgement of sources
   - English proficiency

4. The student must register his Additional Master Thesis Project by submitting an application to the additional thesis coordinator.

5. The additional thesis coordinator is responsible for the administration of the final mark. The final mark will only be registered in the educational registration program (Osiris) when all the requirements – the report and the original assessment form must be handed in – are met.

   It is not permitted to start with the Additional Master Thesis until the student has obtained 45 EC of the MSc examination programme.

Paragraph 2 – Annotations and Honours Programme

Article 14 – Technology in Sustainable Development

1. The examination programme for students who have opted for the annotation known as Technology in Sustainable Development must at least include the following:
   a. A sustainable development colloquium totalling 5 credits: WM0939TU, Engineering for Sustainable Development,
   b. Subjects within or outside the realm of the programme adding up to a total of at least 10 credits to be selected from the two clusters:
      - Design, Analysis and Tools
      - Organisation and Society.
      At least 3 credits should derive from each of the clusters.
      Further information on the subjects to be selected and on the clusters is available from the programme coordinator, in the study guide and from the website of Delft University of Technology.
   c. The Final Thesis must partly focus on the topic of sustainable development. The referent will test the hypothesis of the Final Thesis and the way in which it has been tackled against the extent to which sustainable development issues have been integrated into the project.

2. Students who complete the annotation successfully, receive an annotation Technology in Sustainable Development with their degree certificate.

Article 15 – Entrepreneurship

1. The examination programme for students who have opted for the annotation Entrepreneurship must at least include the following:
   a. Electives related to entrepreneurship adding up to a total of 15 credits, 10 of which are extracurricular,
   b. The Final Thesis must partly focusing on the topic of entrepreneurship.

2. The examination programme for the Entrepreneurship annotation needs the prior approval by the Programme director and a coordinator of Delft Centre for Entrepreneurship.

3. Students who complete the annotation successfully, receive an annotation Entrepreneurship with their degree certificate.

Article 16 – Honours Programme Master

1. Motivated students who have finished their Bachelor's degree course with a weighed averaged mark of 7.5 or higher, and students who have excelled during the first semester (no fails and a weighted average of 7.5 or higher) are eligible for a special individual programme of 20 credits on top of the Master's degree course: the Honours Programme Master.

2. The content of the Honours Programme Master should be thematically consistent. The subject UD2010,

Critical Reflection on Technology, 5 credits, is compulsory for the Honours Programme Master.

3. Students who fulfil, or will fulfil, the requirements laid down in subsection 1, and are interested in the Honours Programme Master can send their application to the programme coordinator together with an essay in English, containing their motivation and a proposal for the programme. The programme has to be approved by a scientific staff member and the programme coordinator.

4. The Honours Programme Master has to be completed during the course of the student's Master's programme. None of the results may be lower than 6,0.The various parts of the programme will be assessed by the respective examiner(s). The fulfilment of all criteria to the Honours Programme Master will be assessed by the board of examiners.

5. Students who have successfully completed the Honours Programme Master will receive a special certificate from the university with their degree certificate.

Paragraph 3 – Bridging programme

Article 17 – Transitional programme for students with a Dutch higher vocational institute Bachelor degree

Students who want to be admitted to the Master's degree course on the basis of a relevant Dutch higher vocational institute Bachelor degree have to complete the following transitional programme first.

code	subject	ECs
AESB1130	Geology 1: Basics	5
AESB1230	Geology 2: North West Europe	5
AESB1420-17	Electricity and Magnetism	5
AESB2320	Physical Transport Phenomina	5
AESB2330	Soil Mechanics *(only for Geo-Engineering)*	5
AESB2440	Geostatistics and Remote Sensing	5
AESB3340	Mechanics and Transport by flow in porous Media	5
WI1708TH1	Analysis 1	3
WI1708TH2	Analysis 2	3
WI1708TH3	Analysis 3	3
WI1808TH1	Linear Algebra (part 1)	3
WI1909TH	Differential Equations	3
CTB2400	Numerical Methods for Differential Equations	3

Paragraph 4 – Deviate from examination programme

Article 18 – The self-composed study programme

1. Students are free to compile examination programmes that are rounded off with a final exam. Such a programme needs prior approval by the Board of Examiners and it must consist entirely or mainly of subjects given in conjunction with the degree course but it can be complemented with subjects provided by or given in other courses.

2. The preliminary approval referred to in subsection 1 must be presented to the Board of Examiners by the student in the form of a justified request.

Paragraph 5 – Examinations and practicals

Article 19 – Practicals and/or exercises

1. The course teaching takes the form of lectures, practicals and/or exercises.

2. Practicals and/or exercises must be completed before students participate in the examination unless otherwise indicated in the study guide.

Article 20 – The types of examinations

1. The examinations linked to the different subjects are to be completed in the way laid down in the study guide pertaining to the subject in question.

2. Examinations pertaining to subjects given by other programmes are to be completed in the way stipulated by or on behalf of the Teaching and Examination Regulations laid down by the relevant programme.

Article 21 – The frequencies, times and sequences of the exams

1. Written or oral examinations are to be completed in principal at the end of the teaching period in which the subject was taught.
2. The resit periods for any of the written exams referred to in subsection 1 are at the end of the next teaching period. For subjects taught in the fourth teaching period the resit period is in August.

3. Practicals and/or exercises may be completed in the way laid down in the relevant timetables.

Paragraph 6 – Access to Geo-Energy Engineering Project, Geoscience and Engineering Fieldwork and Final Thesis

Article 22 – Access to Geo-Energy Project

Students may not embark on the Geo-Energy Project (AESM2305) until they have completed the following subjects:
AESM1305 Geo-Energy Engineering Challenge
AESM1315 Energy Transition
AESM1320 Geology for Geo-Energy
AESM1325 Physics for Geosystems
AESM1330 Forward and Inverse Geomodelling
One course from Category 1 (as listed in Article 4.5) and
Four elective courses from Category 1-4 (as listed in Article 4.5)

Article 23 – Access to Geoscience and Engineering Fieldwork

Students may not embark on the Geoscience and Engineering Fieldwork (AESM2901) until they have completed the subjects Engineering Geology (AESM1630-19) and Site Characterisation and Testing (CIE5320).

Article 24 – Access to the Master Thesis Project

1. Before starting the Master Thesis Project, the student must complete the form CIE-1 respectively AES-1, which can be downloaded from internet. On the basis of that form the Student Administration will check on behalf of the Board of Examiners, whether the student complies with the requirements laid down for the Master Thesis Project. If everything is in order the student can report so to the coordinator linked to the chosen track, and further compile the master's examination programme.

2. In addition to subsection 1, students Geo-Resource engineering must also have completed the course Thesis proposal (AESM2023).

3. Students may embark on the Master Thesis Project only when they have no more than 15 credits of uncompleted subjects of the Master's degree programme from all their other subjects of the programme.

4. The final assessment is the meeting during which the assessment committee's chair grades the results of the student's work. The accompanying presentation constitutes part of the final assessment and takes place preferably on the same day as the final assessment. The final assessment has to occur within four weeks (the months of July and August excluded) after the final thesis report has been handed in.

Article 25 – **Working method of the assessment committee**

1. As soon as the final study phase begins, the assessment committee's chair will indicate to the student which members of the assessment committee are directly involved in the student's supervision.

2. In consultation with the chair and the daily supervisor, the student must draw up a work plan which at least describes the subject and the approach and which gives a list of contents. The work plan must also contain a time schedule with dates for the interim meetings and the final presentation.

4. The date of approval of the work plan marks the official start of the Master Thesis Project. The coordinator will monitor the schedule.

5. Significant changes in the work plan must be approved by the assessment committee.

6. During the final study phase there must be at least one interim meeting with the assessment committee to gauge the progress being made.

7. Before a presentation date can be agreed, the student must have completed all the other examination programme obligations and present the draft report to the complete assessment committee (the so-called green light meeting).

8. The examiner in the assessment committee from the other section (article 23 Rules & Guidelines Board of Examiners) must at least participate in the deliberations from the moment of the assessment of the draft report text referred to in section 7.

9. After the student has received the assessment committee's approval the student must arrange a presentation date.

10. The final assessment and the presentation of the Master Thesis Project should be preferably planned on the same day. At least two of the three academic staff members of the assessment committee, one of whom must be the chair, have to be present at the time of the presentation.

11. Members of the assessment committee who are unable to be present at the time of assessment should react in writing, possibly by email, to the report received from the student beforehand. The reaction has to be addressed to the chair.

12. Each time the assessment committee evaluates matters, the student must compile an official report and post or mail it to the assessment committee for approval. If after a week no reaction has been received, the student can assume that the agreements detailed in the report have been accepted.

13. The chair is responsible for the assessment and determines the final mark after close consultation with the other committee members. The student will not be notified of the procedure that led to the determination of the final mark.

16. The coordinator or a member of the assessment committee appointed in conjunction with the coordinator is responsible for ensuring that the relevant Teaching and Examination Regulations and the Rules and Guidelines laid down by the Board of Examiners are adhered to, in particular whether the commencement stipulations are observed, the subsequent procedures are followed, and the Master Thesis Project is assessed according to uniform norms.

17. The coordinator must keep a record of how long the student has worked on the Master Thesis Project. If this has not been completed within a year, then the coordinator will ask the student and the assessment committee's chairperson why that is so. If the student subsequently does not progress fast enough, the coordinator will notify the Board of Examiners.

Paragraph 7 – Transition Rulings

Article 26 – Transition Ruling 1 September 2008 and before

Transition Rulings of 1 September 2008 and before can be found in previous Annexes.

Article 27 – Transition Ruling

For the students of the MSc Petroleum Engineering and Geosciences track article 30.3 of the TER means that two resits will be given, for the last time for all the courses in the academic year 2019-2020.

In the event that a student in the MSc Petroleum Engineering and Geosciences track is still missing ECTS at the end of the academic year 2019-2020, the following transition regulations are in place. Students can replace courses from the Petroleum Engineering and Geosciences track with courses from the Geo-Energy Engineering track. In principle students can take all the courses of the Geo-Energy Engineering track, with the exemption that: students cannot participate and receive grades for courses with a similar content as those that have been part of the Petroleum Engineering and Geosciences track and for which already ECTS credits have been granted. Please use the table with courses from both tracks as guideline.

Furthermore, the final decision on whether the student is allowed to follow a course of the Geo-Energy Engineering track lies with track coordinators and finally the Board of Examiners.

OLD Petroleum Engineering &Geosciences track		EC			**NEW Geo-Energy Engineering track**	
AES0102	Image Analysis	1				
AES1304	Introduction to Petroleum Engineering and NAM Visit	3		AESM1405	Petroleum Exploration and Production	3
AES1320	Modelling of Fluid Flow in Porous Media	3		AESM1455	Numerical Methods for Subsurface Geoscience Simulation	3
AES1330	Drilling & Production Engineering	4		AESM1435	Production Science and Technology	3
AES1340	Reservoir Engineering	2		AESM1445	Dynamic Modeling and Optimisation	3
AES1350	Reservoir Simulation	2		AESM1455	Numerical Methods for Subsurface Geoscience Simulation	3
AES1360	Production Optimisation	3		AESM1435	Production Science and Technology	3
AES1500	Fundamentals of Borehole Logging	4				
AES1510	Geologic Interpretation of Seismic Data	3		AESM1465	Geological Interpretation of Geophysical Data	3
AES1520	Log Evaluation	2		AESM1460	Reservoir Characterization and Petrophysics	3
AES1802	Geological Fieldwork	3		AESM1470	Field Lab_common core	3
AES1820-2	Reservoir Characterisation & Development	4		AESM1460	Reservoir Characterization and Petrophysics	3
AES1890	Sedimentary Systems	3		AESM1320	Geology	5
AES1920	Geostatistics	2		AESM1330	Forward and Inverse Geomodelling	5
AES1930	Quantification of Rock Reservoir Images	1				
AES3820	Petroleum Geology	3		AESM1405	Petroleum Exploration and Production	3
AES1300-18	Properties of Subsurface Fluids	4		AESM1325	Physics for Geosystems	5
AESM1310-18	Rock Fluid Physics	4		AESM1325	Physics for Geosystems	5
WI4012ta	Mathematics, Special Subjects	4		AESM1330	Forward and Inverse Geomodelling	5
AES1800	Exploration Geology (including Remote Sensing)	3		AESM1405	Petroleum Exploration and Production	3
AES1830	Reservoir Sedimentology	3		AESM1420	Advanced Sedimentary Geology	3
AES1840	Advanced Structural Geology	3		AESM1425	GeoMechanics and Structural Geology	3
AES1850	Geological Modelling	4		AESM1430	Simulation and Building of Stratigraphy	3
AES1860-5	Analysis of Sedimentary Data	3		AESM1475	Outcrop geology for subsurface characterization	3
AES1902	Reservoir Geological Fieldwork (Huesca)	6		AESM1475	Outcrop Geology for subsurface charactization	3

Article 28 – When the rules do not provide

Insofar as this annex does not provide for specific circumstances, the Board of Examiners will make a decision that is in line with this annex to every extent possible and the Board of Examiners will also take article 6 of its Rules & Guidelines into account.