TEACHING AND EXAMINATION REGULATIONS (TER)

IN ACCORDANCE WITH ARTICLE 7.13 OF THE [DUTCH]
HIGHER EDUCATION AND RESEARCH ACT [WHW]

ANNEX

(IMPLEMENTATION REGULATION)

MASTER DEGREE PROGRAMME
CIVIL ENGINEERING

+

MASTER DEGREE PROGRAMME
APPLIED EARTH SCIENCES

+

4TU MASTER DEGREE PROGRAMME
CONSTRUCTION MANAGEMENT AND ENGINEERING

TU Delft

2020
2021

THESE TEACHING AND EXAMINATION REGULATIONS
APPLY TO ALL STUDENTS OF THE COHORT 2020-2021

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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 (CE)
   - the Master degree programme in Applied Earth Sciences (AES)
   - the Interfaculty 4TU Master degree programme Construction Management and Engineering (CME)
   - 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 - Addendum

The following concepts apply in this Regulation:

a.	academic year:	the period from 1 September till 31 August of the following calendar year
b.	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; c.
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 course 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 course, 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 courses 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 course, 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;

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. The Study Guide is an integral part of the TER and its annex.*

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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:	course or component of a course 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, • completing an internship, • participating in fieldwork or an excursion, • conducting tests and experiments, or • participating in other educational activities that are considered essential and that are aimed at acquiring particular 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 (www.studiegids.tudelft.nl);
w.	study guide:	a digital guide to the programme containing specific information pertaining to the various courses;
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 (here: Brightspace);
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 Article 19, section 1, first two complete sentences.

- Paragraph 2 -
Admission and prior education

Article 3a Admissions to the Master degree programme - Addendum

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

b. Applied Earth Sciences

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

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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 distinctive 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:

Civil Engineering and Applied Earth Sciences:

- University Bachelor degree
  Bridging programme to be followed: to be specified upon application.

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 Bridging minor or a custom bridging program as stipulated in the Annex for the MSc CME.

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

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.

Construction Management Engineering:
Bridging programme to be followed: Transitional programme for students with a Dutch higher vocational institute Bachelor degree ("HBO") as stipulated in the annex.

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 appendix to 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 or 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 sections 1 and 2.

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.

5. Civil Engineering and Applied Earth Sciences:
   In order to meet the stipulations outlined in subsection 2 and 4b, knowledge for the programme may be lacking in various subjects as long as it does not exceed the level of 10 credits. The missing subjects can be integrated into the MSc programme.

Article 3b Completion of bridging programme prior to the degree programme

1. A student who is enrolled in a Bachelor degree 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. 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 (CE) respectively in Applied Earth Sciences (AES) or Construction Management and Engineering (CME), whereby the final attainment levels described below must be achieved, providing students 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;

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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 appendix to article 5 TER.

Article 6 Tracks and annotations

1. The Master degree programme in **Civil Engineering** has the following tracks, with the stated content in the annex to this TER:
   - 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 to this TER:
   - 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 to this TER:
   - Geo-Energy Engineering
   - Geo Engineering
   - Geoscience and Remote Sensing
   - Environmental Engineering
   - Applied Geophysics

   - *specialisation:* European Mining Course (EMC)

CONTENT

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 TER MSc Civil Engineering:
   - Integral Design and Management
   - Urban Planning and Engineering
   - Railway Systems

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 scheduling of the examination and the language.

6. The structure and content of the educational programme is elaborated 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 official language of the educational programme is 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 an examination in Dutch instead of English, 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 Honours Coordinator.

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 or the programme specific annex.

3. All students selected for participation in the Honours Programme must submit their options for the faculty component to the Honours coordinator 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 the faculty's Quality Assurance Manual, 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

Article 12a Not applicable

Article 12b Not applicable

Article 13 Registration for written examinations - Addendum

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 participating 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 be assessed. The Board of Examiners will approve the request only in case of extenuating circumstances.

Article 14 Registering for other examinations and practicals - Addendum

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.

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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 - Addendum

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, two opportunities to sit an examination will be offered for discontinued courses in the academic year following the year 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.

CONTENT

Article 18 Oral examinations - Addendum

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.

CONTENT

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 section 1 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 programme 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.

CONTENT

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 course 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:
   - manner (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. The Dean 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 - Addendum

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.

CONTENT

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 17 September 2020.

Adopted by the Dean of the faculty on 17 September 2020.

Appendix to Article 3 of the TER

The following candidates are exempted from the English language test requirement:

- Students with a Bachelor's degree from a Dutch university
- Students with a VWO diploma or VWO English certificate
- Students with an HBO (University of Applied Sciences) degree from a degree programme taught entirely in English
- Students who hold the nationality of one of the following countries: USA, UK, Ireland, Australia, New Zealand or Canada

Sufficient competence in the English language can be demonstrated by passing one of the following tests:

- TOEFL iBT (Test of English as a Foreign Language internet-Based Test) with an overall band score of at least 90
- IELTS (academic version) with an overall band score of at least 6.5
- Cambridge Assessment English:
  - C1 Advanced (Certificate of Advanced English) with an overall score of at least 176.
  - C2 Proficiency (Certificate of Proficiency in English) with an overall score of at least 180.

If a bridging programme needs to be completed before a candidate can be admitted to a Master's programme, the certificate should be obtained before the start of the bridging programme.

Language level for holders of a non-Dutch diploma (d)

Competence in the English language as demonstrated by passing one of the following tests:

- 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
- IELTS (academic version) with an overall band score of at least 6.5 and a minimum score of 6,0 for each section
- Cambridge Assessment English:
  - C1 Advanced (Certificate of Advanced English) with an overall score of 176 and a minimum score of 169 for each section.
  - C2 Proficiency (Certificate of Proficiency in English) with an overall score of 180 and a minimum score of 169 for each section

Certificates more than two years old will not be accepted.

The following candidates are exempted from the English language test requirement:

- Students who hold the nationality of one of the following countries: USA, UK, Ireland, Australia, New Zealand or Canada;
- Students who hold a Bachelor's degree from one of the above countries.

Appendix to Article 5 TER final attainment levels

Construction Management and Engineering

The MSc CME domain-specific requirements as specified below are based upon:

a. the needs of the construction industry as well as on the needs emerging from the development of society and innovations as outlined in the "Introduction" to this document. Also, with regard to this domain, an important characteristic of the development and application of newly acquired knowledge is the fact that it has to be introduced in existing managing and engineering practices. In other words, students also have to become familiar with the management of transition processes and organizational changes in the construction industry;

b. the domain-specific and internationally accepted qualifications as defined by the ABET organization Accreditation Board for Engineering and Technology)

The domain-specific requirements have been translated into final qualifications that fit into the 3TU Academic criteria in which the academic level of the programme is indicated as well. The Master of Science Construction Management and Engineering':

1. **Competent in one or more scientific principles**
   The graduate has knowledge on the following sub-areas of Construction Management and Engineering, is an expert in at least one of them and is able to maintain and expand his expertise in the field of Construction Management and Engineering (for instance, by consulting relevant literature but also look for connections).
   - Project and Process management in the field of Construction Engineering (i.e. complex constructions, large-scale infrastructure, urban developments)
   - Legal and Governance aspects in the field of Construction Engineering
   - Markets and organisations in the field of Construction Engineering
   - Innovations and Integral Design in Construction Engineering
   - The graduate is able to combine management theory and technical knowledge. This ability covers the knowledge and application of technical process management and innovation regarding construction and engineering processes in the subareas above.

2. **Competent in doing research**
   - The graduate has the competence to acquire new scientific knowledge through research or systematic reflection.
   - The graduate understands the potential benefits of research and is able to understand and incorporate the results of research into the own work.

3. **Competent in designing**
   - The graduate is able to
     - Contribute to a functional design of complex constructions or
     - Design management processes in the field of Construction Engineering.

   This means that:
   - The graduate has creativity and synthetic skills with respect to design projects
   - The graduate is application-oriented towards the construction industry when designing constructions or management processes
   - The graduate is able to translate technological concepts and developments into appropriate process innovations for construction.
   - The graduate is able to find a balance between possible solutions of complex requirements, technical possibilities, genuine interests of the parties involved and justified value creation on scientific and operational levels.

4. **A scientific approach**
   - The graduate has the habit of reflecting upon his own work and continuously uses relevant information to improve his capabilities.
   - The graduate has the attitude to endorse his personal development and enhancing his expertise.
   - The graduate knows that models only approximate reality and is able to develop and use them adequately whenever this is beneficial
   - The graduate makes decisions based on calculated risks, costs, time, quality, stakeholders' participation, value creation, legislation and is able to evaluate these decisions
   - The graduate's scientific attitude is not restricted to the boundaries of Construction Management and Engineering, and he is able to cross these where and whenever necessary

CONTENT

5. **Basic intellectual skills**
   - The graduate is able to work independently
   - The graduate is able to work systematically and methodically
   - The graduate is able to reflect on the complete scope of Construction Management and Engineering issues, to critically analyse and to generate novel ideas
   - The graduate is able to invent his own tools, theories and techniques if these are not available

6. **Competent in cooperating and communicating**
   - The graduate is able to work effectively in the context of a multidisciplinary environment, is able to manage complex assignments and can act in different roles depending on the situation,
   - The graduate knows the importance of oral and written communication, in particular in English, and can make effective use of these, this means that:
     a. The graduate is skilled in properly documenting and presenting results of scientific and design work, including the underlying knowledge, choices and considerations, to colleagues and to a broader public.
     b. The graduate is competent in reasoning
     c. The graduate adheres to existing academic conventions, such as giving proper credit and referencing.

7. **Takes account of the temporal and societal context**
   - The graduate is able to form an opinion or judgement and contribute to discussions about complex matters related to Construction Management and Engineering
   - The graduate knows that compromises are unavoidable and is able to effectively deal with these
   - The graduate is aware of the disadvantages for society of certain decisions and can communicate these to the relevant parties (stakeholders). The graduate can take the purpose of the design and its context into consideration.

ANNEX

(IMPLEMENTATION REGULATION)

MASTER DEGREE PROGRAMME
CIVIL ENGINEERING

2020
2021

THESE TEACHING AND EXAMINATION REGULATIONS
APPLY TO ALL STUDENTS OF THE COHORT 2020-2021

TU Delft

- 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 Civil Engineering.

Teaching and Education Regulations MSc Article 7 Subsection 3:
"It is not permitted for any subject in the study programme to have been part of the Bachelor's degree programme on the basis of which the student was admitted to the degree programme. If a compulsory subject was already completed in the aforementioned Bachelor's degree programme, the Board of Examiners will designate an alternative subject in its place. If an elective subject in the study programme was already completed in the aforementioned Bachelor's degree programme, the student will choose an alternative elective subject."

Article 2 Tracks, specialisations and annotations

1. The course comprises the following tracks:
   - Building Engineering
   - Environmental Engineering
   - Geo-engineering
   - Geoscience and Remote Sensing
   - Hydraulic Engineering
   - Structural Engineering
   - Transport & Planning
   - Water Management
   - the Erasmus Mundus programme: Coastal and Marine Engineering and Management (discontinued as of 2020-2021)

2. Within a track or within a specialisation the student may opt for the following annotations mentioned in Articles 16A – 16G:

Cancelled ⊗ ~~Technology in Sustainable Development~~
Cancelled ⊗ ~~Entrepreneurship~~

   - Urban Planning and Engineering ("Stadsingenieur")

Cancelled ⊗ ~~Infrastructure Planning and Environmental Engineering ("Infrastructuur en milieu")~~

   - Integral Design and Management
   - Railway Systems
   - Dynamics of Structures

Please note: as of 30 September 2022, annotations will no longer be offered. Students can start an annotation programme at any time but if they finish the programme with an LOV date (last obligation fulfilled) after 30 September 2022, they will not receive an annotation certificate.

3. The Erasmus Mundus MSc programme Coastal and Marine Engineering and Management has been discontinued as of 2020-2021 and can only be followed by students who started their MSc in 2018-2019. The Erasmus Mundus MSc programme Coastal and Marine Engineering and Management is subject to the programme-specific "Implementations Regulations for the MSc Degree CoMEM". These regulations replace the present Annex for the MSc degree in Civil Engineering in the case of CoMEM only.

4. Within a track the student has to complete the common compulsory block. Furthermore the student can choose for one of the specialisations as mentioned in Articles 5 to 12 or for a free specialisation. The student makes sure he will ask for approval in time as is stipulated in Article 4 Subsection 1.

5. A student can choose to study a double track (two tracks) within one MSc-programme. Both tracks will be mentioned on the diploma (supplement).
   The composition of the programme with a double track should at least fulfil the following requirements:
   - 4 or 5 credits in an Ethics related subject as described in article 3A;
   - Meet all track and specialisation -linked compulsory subjects for track 1;
   - Meet all track and specialisation -linked compulsory subjects for track 2;
   - 20 credits in elective subjects as described in article 3C;
   - A MSc thesis subject which relates to both tracks. From both tracks a member is added to the graduation committee. The programme for a double track should be consulted with and approved by the MSc coordinator of each track.

Compulsory courses that are part of both tracks can count for both tracks. Overlap in courses must be checked by the coordinator, who will ensure that the specialisation is well represented in the MSc programme for each track.

Please note: A double degree (two diplomas, two programmes) is something different than a double track (one diploma, two tracks within one programme). Information on the double degree can be found on: https://www.tudelft.nl/studenten/faculteiten/citg-studentenportal/organisatie/board-of-examiners/faq/ (double degree) The total composition of credits for a double track depends upon the chosen combination.

Article 3 The composition

1. The study programme tracks are compiled in the following way:

   a. At least 4 credits:
      Choose one out of five:
      - Philosophy, Technology Assessment and Ethics for CT (WM0312CIE)
      - Climate Change: Science & Ethics (CIE4510-20)
      - Ethics of transportation (WM1302TU)[1]
      - Ethics of technological risk (WM0376TU)
      - Water ethics (TPM003A)

      CIE4510-20 is compulsory for Geoscience and Remote Sensing or Environmental Engineering students.

   b. 56 credits or 55 credits if WM1302TU, WM0376TU or TPM003A is chosen: track-linked subjects belonging to the chosen track. The track-linked subjects may be subdivided into those that are general track-linked subjects (the common compulsory block) and those that belong to a specialisation as stipulated in Articles 5 to 12 or a free specialisation.
      Track-linked credits, exceeding 55 or 56 credits, will be considered as credits achieved for electives mentioned under c.

   c. 20 credits as follows:

      part 1: 10 credits
      - all subjects from the Civil Engineering MSc programme which may include only one of the following subjects:
        - CIE5050-09 Additional Graduation Work, Research project
        - CIE4040-09 Internship
        - CIE4061-09 Multidisciplinary project, Civil Engineering Consultancy project[2]

1. *Students following the Water Management Track cannot choose Ethics of transportation (WM1302TU) as one out of five.*
2. *Instead of CIE4061-09 Multidisciplinary project, Civil Engineering Consultancy project, a student may take a Joint Interdisciplinary Project (15EC). Please note that 5 EC is part of the extracurricular paragraph of the diploma supplement.*

part 2: 10 credits electives from:

- other subjects from all MSc programmes hosted by the faculty CEG with the exception of the three mentioned subjects above under part 1,
- all subjects offered in conjunction with other MSc degree courses at a Dutch University or at an international university with an exchange contract with TUD
- the specialisation subjects included in the table 'Track linked BSc electives' ('keuzelijst specialisatievakken') as intended in Article 3 of the annex for the Bachelor's degree course in Civil Engineering at Delft University of Technology, as far as they are considered to be convergence subjects (CIE course codes, see list at end of annex),
- interfacultary Master's-level electives at Delft University of Technology with a "WM-code" are admissible up to a maximum of 6 credits. However, language courses, courses on skill subjects and MOOCs are not allowed, irrespective their code. Such courses can only be part of the extracurricular paragraph of the diploma supplement.[3]

Any deviations to this composition requires the approval of the Board of Examiners on forehand. For this a motivated request is needed.

Note:

i) (Building Engineering) Students who take "AR0139: MEGA" in part 2 are not allowed to combine this with "CIE4061-09: Multidisciplinary Project, Civil Engineering Consultancy project". They are encouraged to take AR0139: MEGA instead.

j) If applicable also subjects from annotations can be selected.

d. 40 credits: a track-linked Master Thesis Project (CIE5060-09). The Master Thesis Project consists of a final project, a thesis, a summary of the thesis and a final presentation. The project is subject to a strict planning and time table; specific dates and deadlines need to be set for the evaluation(s) and the final presentation of the project. The planning will be monitored by the graduation coordinator.

In the articles 13, 14, 15, 24 and 25, as well as in the Rules and Guidelines laid down by the Board of Examiners, further stipulations have been laid down in relation to the Internship, the Multidisciplinary Project, Civil Engineering Consultancy project, the Additional Graduation Work and the Master Thesis Project.

Article 4 Registering the tracks and compiling the examination programme

1. At the beginning of his/her study the student must register himself/herself with 'Studielink' as a prospective graduate of the track of his/her choice.

2. Before the Master Thesis Project is started, the student must draw up his/her assessment committee's composition to the MSc-track coordinator for approval. The regulations for the composition of the assessment committee can be found in article 23 of the Rules and Guidelines Board of Examiners.

Article 4a Registration of Study Programme

1. All students must submit an Individual Study Plan (ISP) before the end of their first semester. The individual study plan provides an overview of the full MSc programme the student intends to follow and is worth a minimum total of 120 credits, including all compulsory courses, all specialisation courses and all electives. For the submission of the individual study plan, the following rules apply:
   a. Students of cohort 2020-2021 must submit their individual study plan using My Study Planning.
   b. All students of cohort 2019-2020 and earlier must submit their individual study plan using the form "Master examination programme" and follow the directions given on the form.

3. *This means that subjects like writing, oral presentation, didactics etc. are not allowed within the examination programme but only as extracurricular. Courses offered by the Graduate School are also not allowed within the examination programme, but only extracurricular. Courses with obvious technical-scientific added value for the student's individual program are admissible. The student must state the reasons for this added value when submitting a request for adding the course to the study program.*

2. All submitted individual study plans are assessed by the MSc coordinator on behalf of, and in consultation with, the Board of Examiners. Approval of the individual study plan is granted when, in judgement of the Board of examiners, it is plausible that the proposed programme leads to the achievement of the learning objectives of the programme as formulated in article 4 of the Teaching and Examination Regulations.
   a. Students who have submitted their individual study plans using My Study Planning will be informed of the ISP evaluation through My Study Planning.
   b. Students who have submitted their individual study plans using the form “Master examination programme” will be informed of the ISP evaluation by e-mail.

3. During the course of the study programme, students may request changing electives in their ISP through My Study Planning. Any request will be assessed for approval by the MSc coordinator. In case of a free specialisation the specialisation will preferably also be approved, in addition to the MSc track coordinator, by an academic staff member from the faculty of Civil Engineering and Geosciences from this specialisation.

   If an ISP is not approved, the student must adapt the ISP based on the directions given in the evaluation and resubmit. Once approved, the individual study plan is registered in Osiris and used to monitor the students' progress, as well as to check whether the student has fulfilled all components to graduate.

4. During the course of the study programme, students may always request to change their track and/or specialisation, and thereby their track, specialisation and elective courses:
   a. Students who have submitted their individual study plans using My Study Planning may request a change of their study programme through My Study Planning.
   b. Students who have submitted their individual study plans using the form “Master examination programme” may request a change of their study programme using the form ‘Changes in Master examination programme”.

   Any request for changes of the study programme are assessed by the MSc coordinator on behalf of, and in consultation with, the Board of Examiners. Students are informed of the evaluation of any change request as formulated in article 4 section 2.

Article 5 The Structural Engineering track

1. The Structural Engineering track has six specialisations:
   - Structural Mechanics
   - Concrete Structures
   - Steel and Timber Construction
   - Materials and Environment
   - Road and Railway Engineering
   - Hydraulic Structures

   The compulsory programme for each specialisation consists of a common Structural Engineering block of 32 credits and an additional block of 24 credits.

   In addition to the presented programme students must meet the following requirements:
   - Students with a relevant foreign Bachelor of Science degree will, if required by intake, do CIE4145-09 (Dynamics and Introduction to Continuum Mechanics) as a compulsory elective subject.
   - Students who did their CE BSc at TU Delft but have not done Concrete Structures 2 CTB3335 and the students coming from HBO will have to do CIE3150 as a compulsory elective subject. International students are exempted in case that the student’s BSc program incorporated a course on reinforced concrete at a level comparable to that of CTB3335/CIE3150.
   - Students who have not done CT3109-09 or CTB3330 (Structural Mechanics 4) in the Bachelor’s phase are strongly advised to take CIE3109-09 as an elective subject.

2. Common compulsory block Structural Engineering

All students opting for the track Structural Engineering must complete the following subjects adding up to 32 credits:

code	subject	ECs
CIE4100	Materials and Ecological Engineering	4
CIE4110	Timber Structures and Wood Technology	4
CIE4115	Steel Structures 2	4
CIE4121	Steel Structures 3	4
CIE4140	Structural Dynamics	4
CIE4160	Prestressed Concrete	4
CIE4180	Plates and Slabs	4
CIE4190	Analysis of Slender Structures	4

3. Additional block Structural Mechanics

Students who have opted for the specialisation Structural Mechanics must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4130	Probabilistic Design and Risk Management	4
CIE4143	Shell Analysis, Theory and Application	4
CIE4150	Plastic Analysis of Structures	4
CIE5123	Introduction to the Finite Element Method	4
CIE5145	Random Vibrations	4
CIE5148	Computational Modelling of Structures	4

4. Additional block Concrete Structures

Students who have opted for the specialisation Concrete Structures must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4281	Building Structures 2	4
CIE5110	Concrete – Science and Technology	4
CIE5127	Concrete Bridges	4
CIE5130	Capita Selecta Concrete Structures	4
CIE5148	Computational Modelling of Structures	4

5. Additional block Steel and Timber Construction

Students who have opted for the specialisation Steel and Timber Construction must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4125	Structural Design - Case Study Steel, Timber or FRP	3
CIE5122	Capita Selecta Steel and Aluminium Structures	4
CIE5124	Biobased Structures and Materials	4
CIE5125	Steel Bridges	4
CIE5126-20	Fatigue	3
CIE5128	Fibre-Reinforced Polymer (FRP) Structures	3
CIE5131	Fire Safety Design	3

6. Additional block Materials and Environment

Students who have opted for the specialisation Materials and Environment must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4030	Methodology for Scientific Research	3
CIE4240-19[4]	Forensic Structural Engineering	3
CIE5100	Repair and Maintenance of Construction Materials	4
CIE5102	Forensic Building Materials Engineering	3
CIE5110	Concrete – Science and Technology	4
CIE5130	Capita Selecta Concrete Structures	4
CIE5146	Micromechanics and Computational Modelling of Building Materials	3

7. Additional block Road and Railway Engineering

Students who have opted for the specialisation Road and Railway Engineering must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4860	Structural Pavement Design	6
CIE4870	Structural Design of Railway Track	4
CIE4880	Road Paving Materials, Laboratory Experiment included	7
CIE5850	Road Construction	3
CIE5871	Capita Selecta Railway and Road Structures	4

8. Additional block Hydraulic Structures

Students who have opted for the specialisation Hydraulic Structures must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE3310-09[5]	Open Channel Flow	4
CIE3330[6]	Hydraulic Structures 1	4
CIE4130	Probabilistic Design and Risk Management	4
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4310	Bed, Bank and Shore Protection	4
CIE4345[7]	River Dynamics 1	4

In case one or more courses have been completed in the Bachelor's phase select one or more courses from the following list for at least the same number of credits

code	subject	ECs
CIE4305	Coastal Dynamics 1	6
CIE4325	Ocean Waves	6
CIE5304	Waterpower Engineering	3
CIE5310	Probabilistic Design in Hydraulic Engineering	3
CIE5313-18	Hydraulic Structures 2	4
CIE5314-19	Flood Defences	4

CONTENT

4. *Students cohort 2018-2019 have to follow CIE5126-20 Fatigue instead of CIE4240-19*
5. *Not if CT3310-09 has been completed in the Bachelor's phase*
6. *Not if CT3330 has been completed in the Bachelor's phase*
7. *Not if CT3340 or CIE4345MI has been completed in the Bachelor's phase*

Article 6 The Building Engineering track

1. The Building Engineering track has two specialisations:
   - Building Technology and Physics
   - Structural Design

   The compulsory programme for each specialisation consists of a common Building Engineering block of 20 credits and an additional block of 36 credits.

2. Common compulsory block Building Engineering

All students opting for the track Building Engineering must complete the following subjects adding up to 20 credits:

code	subject	ECs
CIE4202	Architectural History of Buildings	4
CIE4210	Parametric Design and Engineering	3
CIE4220	Introduction to Building Physics and Façades	6
CIE4240-19	Forensic Structural Engineering	3
CIE5981	Forms of Collaboration in Civil Engineering	4

3. Additional block Building Technology and Physics

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

code	subject	ECs
AR0134	Technoledge Façade Design	5
CIE4030	Methodology for Scientific Research	3
CIE4100	Materials and Ecological Engineering	4
CIE4225	Advanced & Applied Building Physics	6
Choose one out of two		
ME45110	Indoor Climate Control Fundamentals	3
AR0097	Climate proof sustainable renovation	5[8]

Complete this 36 EC block with electives from the list below (4. Additional Block Structural Design)

4. Additional block Structural Design

Students who have opted for the specialisation Structural Design must complete the following subjects adding up to 37 credits:

code	subject	ECs
CIE3109-09[9]	Structural Mechanics 4	4
CIE3150[10]	Concrete Structures 2	4
CIE4110	Timber Structures and Wood Technology	4
CIE4115	Steel Structures 2	4
CIE4190	Analysis of Slender Structures	4
CIE4281	Building Structures 2	4
CIE4285-20	Structural Glass	4
CIE5251-09	Structural Design, Special Structures	5

CONTENT

8. *When AR0097 has been completed in the minor, choose ME45110*
9. *Not if CT3109-09 has been completed in the Bachelor's phase*
10. *Not if CT3150 has been completed in the Bachelor's phase*

Extra electives, from the list below		6 or 7

If one or both of the above-mentioned subjects CIE3109-09 and CIE3150 has been done in the Bachelor's phase, the student may choose from:

code	subject	ECs
CIE4030	Methodology for Scientific Research	3
CIE4120	Information Systems for the Construction Industry	4
CIE4121	Steel Structures 3	4
CIE4125	Structural Design - Case Study Steel, Timber or FRP	3
CIE4140	Structural Dynamics	4
CIE4160	Prestressed Concrete	4
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4362-20	Soil Structure Interaction	4
CIE4363	Deep Excavations	4
CIE4381	Engineering Asset Management	4
CIE4481	Systems Engineering Management	4
CIE5124	Biobased Structures and Materials	4
CIE5125	Steel Bridges	4
CIE5127	Concrete Bridges	4
CIE5131	Fire Safety Design	3
CIE5148	Computational Modelling of Structures	4
CIE5260	Structural Response to Earthquakes	4

If a student opts for another technical MSc course as a substitute for one of the courses in the additional block of courses for the specialisation, approval from the master coordinator is mandatory before taking the course. See also art 4.1 for "free specialisation".

Building Engineering Students are not allowed to take CIE4061-09 Multidisciplinary Project, Civil Engineering Consultancy project in c. part 1 of their programme (see Article 3 note i). Instead of CIE4061-09 Building Engineering Students are encouraged to take the course AR0139 MEGA (15 ECTS). It is highly recommended to take this subject in the c. part 1 block of the curriculum. The surplus of 5 ECTS above the required 10 ECTS can be transferred to the b. part 2 or c. part 2 elective free space.

Article 7 The Hydraulic Engineering track

1. The Hydraulic Engineering track has seven specialisations:
   - Coastal Engineering
   - River Engineering
   - Dredging Engineering
   - Ports and Waterways
   - Environmental Fluid Mechanics
   - Hydraulic Structures
   - Flood Risk

   The compulsory programme for each specialisation consists of a common Hydraulic Engineering block of 24 credits, an additional specialisation block and Hydraulic Engineering electives.
   Together these add up to a total of 56 track-linked credits.

   In addition to the presented programme students must meet the following requirements:
   - Students who have not completed Open Channel Flow (CTB3350) in the Bachelor's phase will have to complete CIE3310-09 as a compulsory elective subject. Students with a relevant foreign Bachelor of Science degree will have to complete CIE3310-09 as a compulsory elective subject, if required by intake.
   - Students who have not completed Hydraulic Structures 1 (CTB3355) in the Bachelor's phase will have to complete CIE3330 as a compulsory elective subject. Students with a relevant foreign Bachelor of Science degree will have to complete CIE3330 as a compulsory elective subject, if required by intake.
   - Students with a relevant foreign Bachelor of Science degree will have to complete Dynamics and Introduction to Continuum Mechanics (CIE4145-09) as a compulsory elective subject, if required by intake.

CONTENT

2. Common compulsory block of Hydraulic Engineering track

All students opting for the track Hydraulic Engineering must complete the following subjects adding up to 24 credits:

code	subject	ECs
CIE4130	Probabilistic Design and Risk Management	4
CIE4305	Coastal Dynamics 1	6
CIE4310	Bed, Bank and Shore Protection	4
CIE4325	Ocean waves	6
CIE4345	River Dynamics 1	4

3. Additional block of specialisation Coastal Engineering

Students who have opted for the specialisation Coastal Engineering must complete the following subjects adding up to 17 credits:

code	subject	ECs
CIE4309	Coastal Dynamics 2	5
CIE4330	Ports and Waterways 1	4
CIE4340	Computational Modelling of Flow and Transport	4
CIE5308	Breakwaters and Closure Dams	4

4. Additional block of specialisation River Engineering

Students who have opted for the specialisation River Engineering must complete the following subjects adding up to 19 credits:

code	subject	ECs
CIE4330	Ports and Waterways 1	4
CIE4340	Computational Modelling of Flow and Transport	4
CIE5300	Dredging Technology	4
CIE5311	River Dynamics 2	4
CIE5315	Computational Hydraulics	3

5. Additional block of specialisation Dredging Engineering

Students who have opted for the specialisation Dredging Engineering must complete the following subjects adding up to 19 credits:

code	subject	ECs
CIE4330	Ports and Waterways 1	4
CIE5300	Dredging Technology	4
CIE5311	River Dynamics 2	4
OE44035	Dredging Pumps and Slurry Transport	4
OE44040	Dredging Processes I	4

6. Additional block of specialisation Ports and Waterways

Students who have opted for the specialisation Ports & Waterways must complete the following subjects adding up to 20 credits:

code	subject	ECs
CIE4330	Ports and Waterways 1	4
CIE4340	Computational Modelling of Flow and Transport	4
CIE5300	Dredging Technology	4
CIE5306	Ports and Waterways 2	4
CIE5311	River Dynamics 2	4

7. Additional block of specialisation Environmental Fluid Mechanics

Students who have opted for the specialisation Environmental Fluid Mechanics must complete the following subjects adding up to 16 credits:

code	subject	ECs
CIE4340	Computational Modelling of Flow and Transport	4
CIE5312	Turbulence in Hydraulics	3
CIE5315	Computational Hydraulics	3
CIE5325	Coastal and Basin-scale Physical Oceanography	6

8. Additional block of specialisation Hydraulic Structures

Students who have opted for the specialisation Hydraulic Structures must complete the following subjects adding up to 24 credits

code	subject	ECs
CIE3109-09[11]	Structural Mechanics 4	4
CIE3150[12]	Concrete Structures 2	4
CIE4140	Structural Dynamics	4
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE5260	Structural Response to Earthquakes	4
CIE5313-18	Hydraulic Structures 2	4

9. Additional block of specialisation Flood Risk

Students who have opted for the specialisation Flood Risk must complete the following subjects adding up to 11 credits:

code	subject	ECs
CIE4420[13]	Principles of Geohydrology	4
CIE5310	Probabilistic Design in Hydraulic Engineering	3
CIE5314-19	Flood Defences	4

Students who have opted for the specialisation Flood Risk must additionally complete at least 10 EC chosen from the following subjects:

code	subject	ECs
CIE4140	Structural Dynamics	4
CIE4308	Sediment Dynamics	3
CIE4330	Ports and Waterways 1	4
CIE4367-16	Design of Embankments	3
CIE4390	Geo Risk Management	3
CIE4395	Risk and variability in Geo-Engineering	4
CIE4460	Polders and Flood control	4
CIE5308	Breakwaters and Closure Dams	4
CIE5311	River Dynamics 2	4
CIE5313-18	Hydraulic Structures 2	4
CIE5401	GIS & Remote Sensing for Water Resources	3
WI4052	Risk Analysis	6

CONTENT

11. *Not if CTB3330 has been completed in the Bachelor's phase.*
12. *Not if CTB3335 has been completed in the Bachelor's phase.*
13. *Not if CTB3390 has been completed in the Bachelor's phase. Not combined with CIE3325 or an equivalent course.*

10. Hydraulic Engineering electives

Apart from what is stipulated in Subsections 1 to 9, Hydraulic Engineering students should make sure they complete - depending on their specialisation - a total of 56 track-linked credits by choosing from the above listed subjects or from the list below:

code	subject	EC
CIE4120	Information Systems for the Construction Industry	4
CIE4145-09[14]	Dynamics and Introduction to Continuum Mechanics	4
CIE4160	Prestressed Concrete	4
CIE4180	Plates and Slabs	4
CIE4190	Analysis of Slender Structures	4
CIE4301	Building with Nature in Hydraulic Engineering	5
CIE4320	Vibration-based Monitoring and Identification	4
CIE4361	Behaviour of Soils and Rocks	6
CIE4362-20	Soil-Structure Interaction	4
CIE4363	Deep Excavations	4
CIE4367-16	Design of Embankments	3
CIE4381	Engineering Asset Management	4
CIE4391	Quantitative Asset Modelling	4
CIE4400	Environmental Systems Modelling	4
CIE4481	System Engineering Management	4
CIE5304	Waterpower Engineering	3
CIE5305	Bored and Immersed Tunnels	4
CIE5318	Fieldwork Hydraulic Engineering	4
CIE5450	Hydrology of Catchments, Rivers and Landscapes	4
CIE5490	Operational Water Management	4
CIE5580-19	Ecology and Morphodynamics in Catchments	5
OE44030	Offshore Geotechnical Engineering	4
OE44115	Arctic Engineering	4

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 coordinator of the MSc track Hydraulic Engineering.

CONTENT

14. *For foreign students only*

Article 8 The Water Management track

1. The Water Management track has three specialisations:
   - Hydrology
   - Water Resources Engineering
   - Urban Water Engineering

   The programme consists of a common compulsory Water Management block of 15 credits, and 41 credits Water Management specialisation electives.

2. Common compulsory block Water Management

All students opting for the track Water Management must complete the following subject:

code	subject	ECs
CIE5431	Research skills 1	3[15]
CIE4440	Hydrological Processes and Measurements	4

In addition, they must select two of the following three subjects.
This selection must be approved by the graduation coordinator:

code	subject	ECs
CIE4450	Integrated Water Management	4
CIE4491	Urban Drainage and Water Management	4
CIE4495-13	Fundamentals of water quality and Treatment	4

Adding up to 15 credits of obligatory courses.

3. Water Management specialisation courses

Depending on their specialisation and in consultation with the chair of the assessment committee, Water Management students are required to complete a selection of the following electives adding up to 41 credits from the following five categories. Electives from the categories b to e can only be included in this selection upon approval from the graduation coordinator.

Category a:

code	subject	ECs
CIE3365-16[16]	Introduction to Water Treatment	4
CIE3410-09[17]	Water System Analysis	4
CIE4400	Hydroeconomic Modelling	4
CIE4410	Water Systems, People and Society	4
CIE4415	Design of Water Treatment Plants	5
CIE4420[18]	Principles of Geohydrology	4
CIE4431	Hydrological Modelling	4
CIE4460	Polders and Flood Control	4
CIE4486	Industry Water	5
CIE4703	Water Treatment	6
CIE5401	GIS & Remote Sensing for Water Resources	3
CIE5421	Water and Health	4
CIE5440	Groundwater modelling	4
CIE5450	Hydrology of Catchments, Rivers and Landscapes	4
CIE5471	Hydrological and Ecological Fieldwork in River Systems	4
CIE5490	Operational Water Management	4
CIE5500	Water Law and Organisation	3
CIE5510	Water Management in Urban Areas	4
CIE5541	Urban Water Infrastructure: Monitoring and Modelling	3
CIE5550	Urban Water Transport Infrastructure	4
CIE5560	Engineering and Development	4

15. *The different modules in this course must be followed shortly before or during the initial phase of the MSc thesis research.*
16. *Not if an equivalent subject has been completed in the Bachelor's phase*
17. *Not if an equivalent subject has been completed in the Bachelor's phase*
18. *Not for students who passed CTB3390 or an equivalent course.*

CONTENT

CIE5580	Ecology and Morphodynamics in Catchments	5
CIE5704	Water Treatment Research	5
CIE5432	Research Skills 2	3

The subjects mentioned in section 2 that have not been included in the common compulsory block of 15 EC.

Category b:
The Hydraulic Engineering subjects mentioned in Article 7.

Category c:
The Geoscience and Remote Sensing subjects mentioned in Article 11.

Category d:
The Environmental Engineering subjects mentioned in Article 12

Category e:
The following subject offered in the Faculty of Architecture:

code	subject	ECs
AR1U131	Sustainable Urban Engineering of Territory	5

Article 9 The Transport and Planning track

1. The Transport and Planning track has three specialisations:
   - Transport Networks
   - Road Traffic Systems
   - Public Transport and Railway Systems

   The compulsory programme for each specialisation consists of a common Transport & Planning block of 32 credits, an additional block of 16 credits, and an additional block of electives (8 credits minimum).

   In addition to the presented programme students must meet the following requirements:
   - Students who have not done CTB3370 or CTB3370-18 (Geometric Design of Roads and Railways) in the Bachelor's phase will have to take CIE3370-18 as a compulsory elective subject.

2. Common compulsory block Transport and Planning

All students opting for the track Transport and Planning must complete the following subjects adding up to 32 credits:

code	subject	ECs
CIE4801-18	Transport Modelling	6
CIE4811-18	Planning and Operations of Public Transport Systems	6
CIE4825	Traffic Flow Modelling and Control Part 1	6
CIE4831-18	Empirical Analysis for Transport & Planning	6
CIE4835	Transport Engineering and Optimisation	4
CIE4845	Emerging Topics for Transport & Planning	4

3. Additional block Transport Networks

Students who have opted for the specialisation Transport Networks must complete the following subjects adding up to 16 credits:

code	subject	ECs
CIE5802-18	Advanced Transport Modelling	4
CIE5815	Resilient Transport Systems	4
CIE5816	Urban Regions, Transport and Economics	4
CIE5817	Assessment of Transport Infrastructure and Systems	4

4. Additional block Road Traffic Systems

Students who have opted for the specialisation Road Traffic Systems must complete the following subjects adding up to 16 credits:

code	subject	ECs
CIE5805-18	Intelligent Vehicles for Safe and Efficient Traffic: Design and Assessment	4
CIE5810-19	Traffic Safety	4
CIE5821	Traffic Flow Modelling and Control Part 2	4
CIE5822	Active Modes	4

5. Additional block Public Transport and Railway Systems

Students who have opted for the specialisation Public Transport and Railway Systems must complete the following subjects adding up to 16 credits:

code	subject	ECs
CIE5802-18	Advanced Transport Modelling	4
CIE5803-18	Railway Traffic Management	4
CIE5825	Advanced Public Transport Operations and Modelling	4
CIE5826	Railway Operations and Control	4

6. Transport and Planning electives

Choose two out of the above listed subjects for the additional blocks plus the following list adding up to 8 credits or more:

code	subject	ECs
AE4423-19	Airline Planning and Optimization	4
AE4446	Airport Operations	4
CIE4330	Ports and Waterways 1	4
CIE4874	Elements of Railway Engineering	4
CIE5830	Freight Transport Systems: Analysis and Modelling	5
CIE5875	Railway Asset Management	4
EPA1315	Data Analytics and Visualization	5
ME41105	Intelligent Vehicles	4
ME44305	Delft Systems and Simulation	5
SC42015	Control Theory	6
SEN1221	Statistical Analysis of Choice Behaviour	5
SEN1721	Travel Behaviour Research	5
TPM004a	Transport Safety (former CIE5811)	4

Article 10 The Geo-Engineering track

1. The Geo-Engineering track has one specialisation:
   - Geo-Engineering

2. Common compulsory block Geo-Engineering

All students opting for the track Geo-Engineering must complete the following subjects adding up to 34 credits:

code	subject	ECs
AESM1630-19	Engineering Geology	5
AESM1700	Consolidation of Soils	3
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

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	Introduction to Geotechnical Engineering *Not for students who passed CTB2310, AESB2330, (Soil Mechanics) or an equivalent course*	3
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
CIE4420	Principles of Geohydrology *Not for students who passed CTB3390, AESB3340, or an equivalent course*	4

3. Additional block Geo-Engineering

Students are required to complete a selection of the following recommended subjects adding up to a total of 56 track-linked credits.

code	subject	ECs
AES1640-11	Environmental Geotechnics	4
AES1720-11	Rock Mechanics Applications	5
AESM2901-16	Engineering Geology Fieldwork	10
CIE3109-09	Structural Mechanics 4	4
CIE4353	Continuum Mechanics	6
CIE4362-20	Soil-structure Interaction	4
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

Other courses than the ones listed for the specialisation part or the 20 ECs free electives may be acknowledged as an elective only after consultation with and explicit approval of the MSc coordinator.

Article 11 The Geoscience and Remote Sensing track

1. The Geoscience and Remote Sensing track has one specialisation:
   - Geoscience and Remote Sensing

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

CIE4510-20	Climate change: Science & Ethics	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 29 credits:

code	subject	ECs
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

3. Additional block Geoscience and Remote Sensing

Students are required to complete a selection of the following subjects adding up to a total of 27 credits. Choose at least 20 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
CIE4614-20	3D surveying of civil and offshore infrastructure	5
CIE4616	Remote sensing and big data	5
CIE4620	Climate data analysis	5
CIE4625	Climate modelling	5
CIE4708	Water in the atmosphere	5
CIE5401	GIS and remote sensing for WRM	3

and choose out of:

- Master's degree course subjects Civil Engineering or Applied Earth Sciences
- GRS-related courses from other faculties
- Courses to be selected in consultation with the track coordinator of Geoscience and Remote Sensing

Article 12 The Environmental Engineering track

1. 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).

2. Common compulsory block Environmental Engineering

In addition to the presented specialisation programme students must meet the following requirements:

- Students who have not done Python or Matlab modelling in the Bachelor's phase must take "CTB2001WO-20 Computer programming BSc Bridging" as an elective subject.[19]

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

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

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

CIE4510-20	Climate change: Science & Ethics	4

CONTENT

19. *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.*

3. 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
CIE4703-19	Water Treatment	6
CIE4704	Chemical Conversions in Environmental Engineering	5
CIE4705	Environmental Biotechnology & Microbiology	6
CIE4710	Materials separation in Waste Processing	5
CIE5421	Water and Health	4
CIE5702	Conceptual Process design	5
CIE5704	Water Treatment Research	5

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

5. 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 3, part 1c. 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 13 Internship

1. Before the internship commences, an internship agreement has to be concluded between the supervisor of CEG (the examiner from the relevant subject area), the supervisor at the company or institution where the student is undertaking the internship, and the student. If no signed internship agreement has been handed in at the Internship Office according to the administrative procedure as described in the study guide before the commencement of the internship, the internship will not be accepted.

2. All students need to register their internship in Onstage, prior to the start of their internship. Information about the registration procedure can be found in the study guide.

3. The internship agreement must at least outline the aims and contents of the practical training period, and the personal learning objectives defined by the student.

4. The learning objectives stated in the study guide, form the basis for the assessment. The period of the internship will be seven (7) full time weeks and the assessment will be based on these seven weeks. Should the duration of the internship exceed seven weeks, the agreement will need to stipulate which particular seven weeks of the internship will be assessed.

5. The university supervisor will assess the subject-related aspects as well as student's own assessment of the internship and will determine whether the report meets the requirements laid down for the structure and production of the report. The supervisor of CEG is responsible for the final mark, taking into consideration the evaluation made by the company or institution supervisor.

CONTENT

6. The official date of exam (i.e. the completion of the internship) will be the date on which the final internship document(s) is/are submitted to the Internship Office.

7. In principle all internships report are public. If it is necessary the university offers the possibility of labelling an internship report as confidential, identical to the arrangement for the MSc Thesis. With that label, the report will be available only to the university supervisor, the examiner responsible for internships and the administrator of the internship archive. After two years, counted from the end date of the internship, the label expires and the report becomes public. In the case confidentiality is actually an issue, the company needs to subscribe explicitly and beforehand to the label. Vice versa, if the label appears insufficient for the companies demand for confidentiality, there is no internship. If insufficiency of the label is raised only during or at the end of the internship, it is likely that the internship is nullified by the university.

Article 14 Multidisciplinary Project, Civil Engineering Consultancy Project

1. The Multidisciplinary Project, Civil Engineering Consultancy Project, is a group project that consists of minimal 4 students and maximal 6 students. The students within the group must be of at least two different master tracks since it has to multidisciplinary.

2. All groups have to be registered at the Student- and International Office CEG, prior to the start of the project. Information about the registration procedure can be found in the study guide.

3. All students have to have a Bachelor's degree before they start the project.

4. 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. The group result will also be the individual final result unless the main supervisor has sound reason to deviate for one or more students in the group.

5. The students must set up an assessment committee, which must consist of at least two examiners. The committee must consist of representatives of all disciplines present in the project group.

6. 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.

Article 15 Additional Graduation Work, Research Project

1. During the Additional Graduation Work, Research Project, the student will work as member of a CEG research group on a specific research task which is part of ongoing research. The research project should be distinguishable from the regular Master Thesis Project. It can be preparation for the master thesis project, but it can never be a part of the master thesis project.

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

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

4. 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.

5. The Additional Graduation Work, Research Project must be assessed by at least two examiners from the academic staff at Delft University of Technology.

6. 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.

CONTENT

- Paragraph 2 -
Annotations and Honours Programme

Article 16A Technology in Sustainable Development

This annotation will no longer be offered.

Article 16B Entrepreneurship

This annotation will no longer be offered.

Article 16C Urban Planning and Engineering (“Stadsingenieur”)

1. The examination programme for students who have opted for the annotation Urban Planning and Engineering must at least include the following:
   a. 20 credits as mentioned in Article 3 Subsection 1 clause c, relating to one or more of the following fields:
      - Urban and Regional Planning
      - Infrastructure Planning
      - Real Estate
      - Site Development
      - Land Clearing
      - Urban Civil Engineering.

   b. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 Subsection 1 clause d, partly focusing on the topic of at least one of the above mentioned fields.
   The annotation can be obtained within the examination programme (120 credits) if the student uses the electives and/or the possibilities mentioned in Article 3 Subsection 1 clause c, otherwise these electives and/or possibilities will be extracurricular.

2. The examination programme for the Urban Planning and Engineering annotation needs the prior approval by the Board of Examiners, who will seek the programme director’s advice.

Article 16D Infrastructure Planning and Environmental Engineering ("Infrastructuur en milieu")

This annotation will no longer be offered.
Students who already commenced with the annotation can finish their programme. Please refer to the TER of the cohort you started in.

Article 16E Integral Design and Management

1. The examination programme for students who have opted for the annotation Integral Design and Management must include the following:
   a. Subjects within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of 8 credits

code	subject	ECs
CIE4381	Engineering Asset Management	4
CIE4120	Information Systems for the Construction Industry	4

If CTB 3380 has been completed in the Bachelor's phase, then CIE 4381 must be replaced by 4 credits of the list of courses of (article 13E) clause b.

   b. Subjects from the two lists below adding up to a total of at least 6 credits (10 credits if CTB3380 has been completed in the Bachelor's phase):

i. Students may use one course out of their own MSc track program as an IDM elective from the list below:

code	subject	ECs
CIE4100	Materials and Ecological Engineering	4
CIE4130	Probabilistic Design and Risk Management	4
CIE4395	Risk and Variability in Geo Engineering	4
CIE4491	Urban Drainage and Watermanagement	4
CIE5830	Freight Transport Systems: Analysis and Modelling	5
CIE5981	Forms of Collaboration in Civil Engineering	4

ii. Additional elective(s) from the list below, which is not yet a compulsory for his/her track specialization:

CIE4170	Construction Technology for Civil Engineering Projects	4
CIE4391	Quantitative Asset Modelling	4
CIE4481	System Engineering Management	4

Another elective course which is related to the learning objectives of the IDM annotation (digital construction, asset management, and systems engineering), to be approved by the IDM annotation coordinator.

   c. A Multidisciplinary Project (CIE4061-09/Multidisciplinary Project, Civil Engineering Consultancy Project) or an Internship (CIE 4040-09/Internship) carrying 10 credits as mentioned in Article 3 Subsection 1 clause c.
   The Multidisciplinary Project or Internship must focus on the topic of integral design and management. The coordinator will test the hypothesis of the project and the way in which it has been tackled against the extent to which integral design and management issues have been integrated into the project.
   d. A Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 Subsection 1 clause d. The Master Thesis Project must partly focus on the topic of integral design management. The coordinator will test the hypothesis of the project and the way in which it has been tackled against the extent to which integral design and management issues have been integrated into the project.
   e. Deviation from the list of electives may be possible, but only after the explicit approval of the IDM annotation coordinator.

Article 16F Railway Systems

1. The examination programme for students who have opted for the annotation Railway Systems must include the following:
   a. subjects within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of 8 credits:

code	Subject	EC's
CIE4874	Elements of Railway Engineering	4
CIE5826	Railway Operations and Control	4

   b. subjects from the list below within or outside the compulsory or elective subjects of the chosen track and/or specialisation adding up to a total of at least 14 credits:

code	subject	ECs
CIE4811-18	Planning and Operations of Public Transport Systems	6
CIE4870	Structural Design of Railway Track	4
CIE4871	Design and Maintenance of Railway Vehicles	4
CIE4873	Wheel-Rail Interface	4
CIE5803-18	Railway Traffic Management	4
CIE5871	Capita Selecta Railway and Road Structures	4
CIE5874	Life-Cycle Performance by Design of Railway Assets	4
CIE5875	Railway Asset Management	4
TPM004a	Transport Safety	4

2. Focusing on the topic of railway A Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 Subsection 1 clause d, operations and/or railway engineering. The annotation coordinators will test the hypothesis of the project and the way in which it has been tackled against the extent to which railway operations and/or railway engineering has been integrated into the project.

3. The examination programme for the Railway Systems annotation needs the prior approval by the Board of Examiners, who will seek the programme director's advice.

Article 16G Dynamics of Structures

1. The examination programme for students who have opted for the annotation Dynamics of Structures must at least include the following:
   a. The following subjects adding up to a minimum of 20 credits:

code	course	ECs
CIE4140	Dynamics of Structures	4
CIE4260	Measurement and Analysis of Vibrations	4
CIE4320	Vibration-based Monitoring and Identification	4
CIE5145	Random Vibrations	4
CIE5260	Structural Response to Earthquakes	4
CIE5340-18	Soil Dynamics	4

   b. a Master Thesis Project carrying 40 credits in line with what is stipulated in Article 3 Subsection 1 clause d, partially focusing on the topic of Dynamics of Structures.

2. The annotation can be partly obtained within the examination programme (120 credits) if the student uses track-linked subjects or the electives and/or the possibilities mentioned in Article 3 Subsection 1 clause c, otherwise these electives and/or possibilities will be extracurricular.

3. The examination programme for the Dynamics of Structures annotation needs the prior approval by the coordinator and the Board of Examiners.

Article 17 Master's Honours Programme

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 Master's Honours Programme.

2. The content of the Honours Programme should be thematically consistent. The subject UD2010, Critical Reflection on Technology, 5 credits, is compulsory to the Master's Honours Programme.

3. Students who fulfil, or will fulfil, the requirements laid down in Subsection 1, and are interested in the Master's Honours Programme 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 Master's Honours Programme has to be completed during the course of the student's Master's programme. None of the results may be lower than 6.0.

5. The various parts of the programme will be assessed by the respective examiner(s). The fulfilment of all criteria to the Master's Honours Programme will be assessed by the Board of Examiners.

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

- Paragraph 3 -
Transitional programme

Article 18 Transitional programme for students with a Dutch higher vocational institute Bachelor degree ("HBO")

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 a transitional programme **first**, consisting of a common deficiency block of 26 to 29 credits and an additional track-linked block of 10 to 16 credits.

Students participating in the transitional programme as part of their relevant higher vocational education, have to complete the common deficiency block within their higher vocational education examination programme. Furthermore, they have to complete the additional track-linked block **before** they will be admitted to the Master's degree course.

Deficiency courses from the transitional programme **cannot** be transferred to the Master's Degree Programme.

Common deficiency block

code	subject	ECs
CTB1210	Dynamics and Modelling	5
CTB2001HBO-16	Computer Programming HBO	3
CTB2400	Numerical Methods for differential Equations	3
WI1708TH1	Analysis 1	3
WI1708TH2	Analysis 2	3
WI1708TH3	Analysis 3	3
WI1807TH1	Linear Algebra (part 1)	3
WI1909TH	Differential Equations	3
WI2031TH	Kansrekening en statistiek voor hbo-instromers	3

Additional track-linked block

Furthermore the following subjects have to be completed within the transitional programme:

In case the track Structural Engineering has been chosen:

code	subject	ECs (total 29 + 15)
CT1730HBO	Introduction to Geotechnical Engineering	3
CTB2210	Structural Mechanics 3	5
CTB2300	Dynamics of Systems	3
CTB3330	Structural Mechanics 4	4

In case the track Building Engineering has been chosen:

code	subject	ECs (total 29 + 15)
CT1730HBO	Introduction to Geotechnical Engineering	3
CTB2210	Structural Mechanics 3	5
CTB2300	Dynamics of Systems	3
CTB3340-15	Building Structures 1	4
consisting of:		
CTB3340-15 D1	Constructies van gebouwen 1/ Building Structures 1, deel 1	2
CTB3340-15 D2	Constructies van gebouwen 1/ Building Structures 1, deel 2	2

In case the track Hydraulic Engineering has been chosen:

code	subject	ECs (total 29+ 16)
CT1730HBO	Introduction to Geotechnical Engineering	3
CTB2110	Fluid Mechanics	5
CTB2210	Structural Mechanics 3	5
CTB2300	Dynamics of Systems	3

In case the track Water Management has been chosen:

code	subject	ECs (total 29+ 14)
CTB2110	Fluid Mechanics	5
CTB2420-17	Hydrology	5
CTB3365 -16	Introduction to Water Treatment	4

In case the track Transport and Planning has been chosen:

code	subject	ECs (total 29 + 11)
CT1730HBO	Introduction to Geotechnical Engineering	3
CTB3370-18	Geometrical Design of Roads and Railways	4
CTB3420	Integral Design of Infrastructure	4

In case the track Geo-Engineering has been chosen:

code	subject	ECs (total 29 + 12)
CT1730HBO	Introduction to Geotechnical Engineering	3
CTB2210	Structural Mechanics 3	5
CTB3425-17	Monitoring and Stability of Dikes and Embankments	4

CONTENT

In case the track Geoscience and Remote Sensing has been chosen:

code	subject	ECs (total 26 + 10)
CTB2300	Dynamics of Systems	3
CTB3310	Surveying and Mapping	4
WI1807TH2	Linear Algebra 2	3

In case the track Environmental Engineering has been chosen:

code	subject	ECs (total 29 + 14)
CTB2110	Fluid Mechanics	5
CTB2420-17	Hydrology	5
CTB3365-16	Introduction to Water Treatment	4

- Paragraph 4 -
Deviate from examination programme

Article 19 The free 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.

Article 20 Deviate from the examination programme

The Board of Examiners may allow students to deviate from the examination programme.

- Paragraph 5 -
Examinations and practicals

Article 21 Practicals

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

2. Practicals must be completed before students participate in the examination unless otherwise is indicated in the study guide pertaining to that particular subject.

Article 22 The types of examinations

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.

Article 23 The frequencies, times and sequences of the exams

1. Written and oral examinations are to be completed 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 may be completed in the way laid down in the relevant timetables.

- Paragraph 6 -
Procedure to Master Thesis Project

Article 24 Access to the Master Thesis Project

1. 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.

2. 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.

3. The regulations for the composition of the assessment committee can be found in article 23 of the Rules and Guidelines Board of Examiners.

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.

CONTENT

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.

14. 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.

15. 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 chair 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 rulings 1 September 2009 and before

Transition Rulings of 1 September 2009 and before can be found in previous Annexes (Implementation Rules).

Article 27 Transitional Rulings 2016-2020

A number of subjects belonging to the programme 2019-2020 are no longer available (in their original form) for the academic year 2020-2021.

Subject available in academic year 2019-2020			Replacement subject in programme 2020-2021		
code	**subject**	**credits**	**code**	**subject**	**credits**
CIE4285 *	Structural glass	4	CIE4285-20	Structural glass	4
CIE4510	Climate Change: Science & Ethics	4	CIE4510-20	Climate Change: Science & Ethics	4
OE44055	Load Identification and Monitoring of Structures	4	CIE4320	Vibration-based Monitoring and Identification	4
CIE4614-18 *	3D Surveying of Civil and Offshore Infrastructure	4	CIE4614-20	3D Surveying of Civil and Offshore Infrastructure	5
CIE5126 *	Fatigue	3	CIE5126-20	Fatigue	3
CIE4362 *	Soil Structure Interaction	3	CIE4362-20	Soil Structure Interaction	4
CTB2000WO	Computer programmeren WO instromers	2	CTB2000WO-20	Computer programmeren WO instromers	2

* *In the academic year 2020-2021, two resits for the exam of the course will be scheduled*

Subjects from the programme 2019-2020 or earlier programmes that were available in the academic year 2019-2020, that are no longer available in the academic year 2020-2021 and that are replaced by a group of subjects are:

Subjects in programme 2019-2020			Replacement subject in 2020-2021		
code	**subject**	**credits**	**code**	**subject**	**credits**
CIE5302 *	Stratified Flows	3	CIE5325	Coastal and Basin-scale Physical Oceanography	6
CIE5317 *	Physical Oceanography	3			

* *In the academic year 2020-2021, two resits for the exam of the course will be scheduled*

Subjects from the programme 2019-2020 or earlier programmes that were available in the academic year 2019-2020, that are no longer available in the academic year 2020-2021 and that not will be replaced, are:

code	subject	credits
CIE4612 *	Research Seminars 1	1
CIE5602 *	Research Seminars 2	1
CIE5603	Advanced Project on GRS	3

* *For students who need a resit, a tailor-made solution will be arranged*

CONTENT

1. Transition ruling for CIE4285

In the academic year 2020-2021, there will be two resits of the course. The obtained results of the design exercise/ practical of the course will remain valid. If a student needs to retake the design exercise/practical, this will be made possible in the academic year 2020-2021.

2. Transition ruling for CTB/CIE3345

A student from cohort 2016-2017 (or earlier), obligated to follow the course CTB/CIE3345 according to the annex, must follow the course CIE4220 Introduction to Building Physics and Facades. See the learning management page (Brightspace) of the course for a flowchart of the specifics.[20]

3. Transition ruling for CIE4215

A student from cohort 2016-2017 (or earlier) who did not pass this compulsory course CIE4215, is obligated to follow the course CIE4220 Introduction to Building Physics and Façades (6 EC). See the learning management platform page (Brightspace) of the course for a flowchart of the specifics.[21]

4. Transition ruling for the Transport and Planning track

Students who switch from the 2017-2018 programme to the 2018-2019 programme can use the following list of equivalencies:

New code	Subject	Former code
CIE4801-18	Transport Modelling	CIE4801
CIE4811-18	Planning and Operations of Public Transport Systems	CIE4811-09
CIE4825	Traffic Flow Modelling and Control Part 1	See below*
CIE4831-18	Empirical Analysis for Transport & Planning	CIE4831-09
CIE4835	Transport Engineering and Optimisation	Not relevant
CIE4845	Emerging topic for Transport & Planning	Not relevant
CIE5802-18	Advanced Transport Modelling	CIE5802-09
CIE5803-18	Railway Traffic Management	CIE5803-09
CIE5805-18	Intelligent Vehicles for Safe and Efficient Traffic: Design and Assessment	CIE5805
CIE5810-18	Traffic Safety	CIE5810-09
CIE5815	Resilient Transport Networks	Not relevant
CIE5816	Urban Regions, Transport, and Economics	See below***
CIE5817	Assessment of Transport Infrastructure and Systems	CIE4760**
CIE5821	Traffic Flow Modelling and Control Part 2	See below*
CIE5822	Active Modes	Not relevant
CIE5825	Advanced Public Transport Operations and Modelling	Not relevant
CIE5826	Railway Operations and Control	CIE4872
CIE5830	Freight Transportation Systems: Analysis and Modelling	CIE4840****
TPM004a	Transport Safety	CIE5811

* *The courses Traffic Flow Modelling and Control Part 1 (CIE4825) and Part 2 (CIE5821) are equivalent to the combination of CIE4821-09 and CIE5804-09 or CIE4821-09 and CIE4822-09. The second option leads to 2 credits extra.*

** *CIE4760 is 6EC while CIE5817 is 4 EC. This thus leads to 2 credits extra.*

*** *The course Urban Regions, Transport and Economics (CIE5816) is equivalent to either CIE5730 or CIE5750.*

**** *The course CIE4840 is 4EC while CIE5830 is 5EC. This is thus 1 credit short.*

For students following the programme according to the annex 2017-2018 or earlier, the list of electives to choose two courses from is extended with the following courses:

code	subject	ECs
CIE4835	Transport Engineering and Optimisation	4
CIE4845	Emerging Topics for Transport & Planning	4
CIE5815	Resilient Transport Systems	4
CIE5822	Active Modes	4
CIE5825	Advanced Public Transport Operations and Modelling	4

20. *Flowchart transition ruling CIE3345-CIE4215*

21. *Flowchart transition ruling CIE3345-CIE4215*

CONTENT

List of convergence subjects (ex article 3 annex):

Course code MSc	Course name English
CIE3300-09	Use of Underground Space
CIE3310-09	Open Channel Flow
CIE3325	Mechanics and Transport by Flow in Poreus Media
CIE3330	Hydraulic Structures 1
CIE3360	Water System Analysis
CIE3370-18	Geometric design of roads and railways
CIE3415	Water Management Research
CIE3425	Monitoring and Stability of Dikes and Embankments
CIE3430	Integral Design of Infrastructure

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.

CONTENT

ANNEX

(IMPLEMENTATION REGULATION)

MASTER DEGREE PROGRAMME
APPLIED EARTH SCIENCES

2020
2021

THESE TEACHING AND EXAMINATION REGULATIONS
APPLY TO ALL STUDENTS OF THE COHORT 2020-2021

TU Delft

- Paragraph 1 -
Compiling the study programme

Article 1 The study load

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

Article 2 Tracks, specialisations and annotations

1. Students can choose one of the following tracks in the MSc AES programme:
   - Geo-Energy Engineering, as laid down in Article 5
   - Geo-Engineering, as laid down in Article 6
   - Geoscience and Remote Sensing, as laid down in Article 7
   - Environmental Engineering, as laid down in Article 8
   - Applied Geophysics, as laid down in Article 9
   - European Mining Course as laid down in Article 10

2. Information about courses and admission requirements for courses can be found in the online study guide.

Article 3 Registering the tracks and compiling the examination programme

1. All students must submit an Individual Study Plan (ISP) before the end of their first semester. The ISP provides an overview of the full MSc programme the student intends to follow and is worth a minimum total of 120 credits, including all compulsory courses, all specialisation courses and all electives. For the submission of the ISP the following rules apply:
   a. Students of cohort 2020-2021 must submit their ISP using My Study Planning;
   b. All students of cohort 2019-2020, or earlier, must submit their ISP using the form "Master Examination Programme" and follow the directions given on the form.

2. All submitted ISPs are assessed by the MSc coordinator on behalf of, and in consultation with, the Board of Examiners. Approval of the ISP is granted when, in judgement of the Board of Examiners, it is plausible that the proposed programme leads to the achievement of the learning objectives of the programme, as formulated in article 4 of the Teaching and Examination Regulations.
   a. Students who have submitted their ISP using My Study Planning will be informed of the ISP evaluation through My Study Planning;
   b. Students who have submitted their ISP using the form "Master Examination Programme" will be informed of the ISP evaluation by e-mail.

3. During the course of the study programme, students may request changing electives in their ISP through My Study Planning. Any request will be assessed for approval by the MSc coordinator. In case of a free specialisation, the specialisation will preferably also be approved by an academic staff member from the faculty of Civil Engineering and Geosciences from this specialisation.

   If an ISP is not approved, the student must adapt the ISP based on the directions give in the evaluation and re-submit. Once approved, the ISP is registered in Osiris and used to monitor the student's progress and to check if the student has fulfilled all components to graduate.

4. During the course of the study programme, students may always request to change their track and/or specialisation, and thereby their track, specialisation and elective courses:
   a. Students who have submitted their ISP using My Study Planning may request a change of their study programme using My Study Planning;
   b. Students who have submitted their ISP using the form “Master Examination Programme” may request a change of their study programme by using the form “Changes in Master Examination Programme”.

   All request for changes of the study programme are assessed by the MSc coordinator on behalf of, and in consultation with, the Board of Examiners. Students are informed of the evaluation of any change request as formulated in article 3, section 2.

5. Prior to the start of the Master thesis students need to present their examination programme together with the title, a short abstract, a time schedule and the chairperson and members of the assessment committee of the Final Thesis for approval. If the examination programme satisfies the rules as laid down in this Annex it can be approved by the MSc-track coordinator only; if the programme does not satisfy the rules as laid down in this Annex, it also needs to be approved by the Board of examiners, with a motivation for the deviation from these regulations.

6. Before the Master Thesis Project is started, the student must draw up his/her assessment committee’s composition to the MSc-track coordinator for approval. The regulations for the composition of the assessment committee can be found in article 23 of the Rules and Guidelines Board of Examiners.

7. 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 the Board of Examiners according to section 2 and 3 of this article.

Article 4 Rules for choosing free electives

1. 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 with which TU Delft has an exchange contract;
   - An internship (CIE4040-09, 10 EC), or Additional Thesis (AES4011-10), or 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;
   - Language courses, skills subjects and MOOCs are **not** allowed within the examination Programme, they can only be part of the extracurricular section of the diploma supplement[1].

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 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

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

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

4. 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	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 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 Geo-Engineering track has one specialisation:
   - Geo-Engineering

   The Geo-Engineering track follows the structure of the Civil Engineering programme. It consists of:

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
AESM1700	Consolidation of Soils	3
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
AESM2606	Final Thesis Geo Engineering	40

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	Introduction to Geotechnical Engineering *Not for students who passed CTB2310, AESB2330, (Soil Mechanics) or an equivalent course*	3
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
CIE4420	Principles of Geohydrology *Not for students who passed CTB3390, AESB3340, or an equivalent course*	4

3. Additional block Geo-Engineering

Students are required to complete a selection of the following recommended subjects adding up to a total of 56 track-linked credits.

code	subject	ECs
AES1640-11	Environmental Geotechnics	4
AES1720-11	Rock Mechanics Applications	5
AESM2901-16	Engineering Geology Fieldwork	10
CIE3109-09	Structural Mechanics 4	4
CIE4353	Continuum Mechanics	6
CIE4362-20	Soil-structure Interaction	4
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

CONTENT

4. Ethics courses (4 or 5 EC)

Choose one out of five:

- Philosophy, Technology Assessment and Ethics for CT (WM0312CIE)
- Climate Change: Science & Ethics (CIE4510-20)
- Ethics of transportation (WM1302TU)[2]
- Ethics of technological risk (WM0376TU)
- Water ethics (TPM003A)

5. Free electives

The rules for free electives can be found in article 4 of this annex.

Other courses than the ones listed for the specialisation part or the 20 ECs free electives may be acknowledged as an elective only after consultation with and explicit approval of the MSc coordinator.

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
CIE4510-20[3]	Climate Change: Science & Ethics	4
CIE4601	Physics of the Earth and Atmosphere	5
CIE4603-16	Geo-signal Analysis	6
CIE4604	Simulation and Visualisation	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 20 EC 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
CIE4614-20	3D Surveying of Civil and Offshore Infrastructure	5
CIE5401	GIS and Remote Sensing for WRM	3
CIE4608	Water in the Atmosphere	5
CIE4620	Climate Data Analysis	5
CIE4625	Climate Modelling	5
CIE4616	Remote Sensing and Big Data	5

2. *Students following the Water Management Track cannot choose Ethics of transportation (WM1302TU) as one out of five.*
3. *Not compulsory if Bachelor's degree included WM0325TA Technics and Responsibility.*

CONTENT

And choose out of:

- Master's degree course subjects Civil Engineering or Applied Earth Sciences;
- GRS-related courses from other faculties;
- Courses to be selected in consultation with the track coordinator of Geoscience and Remote Sensing.

4. Electives

Choose 10 credits out of:

- An internship (CIE4040-09, 10 EC), or Additional Thesis (AES4011-10), or Research Project (CIE4061-09, 10 EC) or Multidisciplinary Project, Civil Engineering Consultancy Project (CIE4061-09, 10 EC);
- Additional Geoscience and Remote Sensing electives as outlined in subsection 3.

Choose 10 credits of electives out of:

- 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 with which TU Delft has an exchange contract;
- Interfaculty Master's level electives at Delft University of Technology with a "WM-code" to a maximum of 6 credits. However, language courses, skills subjects and MOOCs are **not** allowed within the examination Programme, they can only be part of the extracurricular section of the diploma supplement[4].

Article 8 The Environmental Engineering track

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

2. The compulsory programme for each specialisation consists of a common compulsory Environmental Engineering block of 21 credits and a 4 credits compulsory Ethics course. Depending on the student's specialisation profile they have an additional block of 36 credits (Environmental Technology) or 34 credits (Environmental Science).

3. Common compulsory block Environmental Engineering:

All students opting for the track Environmental Engineering must complete the following subjects adding up to 65 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
AESM2650	Final Thesis Environmental Engineering	40

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[5].

CONTENT

4. *This means that subjects like writing, oral presentation, English and Dutch are not allowed within the examination programme.*
5. *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.*

4. 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
CIE4703-19	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

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
CIE4706	Introduction to Meteorology	5
CIE4707	Air Quality	5
CIE4708	Water in the Atmosphere	5
CIE4709	Remote Sensing for Environmental Monitoring	5
CIE5703	Urban Climate & Hydrology	5
CIE5701	From Field Observations to Modelling	5

6. 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 4. 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

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

2. 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 AESM1511 Field Geophysics and Signal Analysis with Matlab/Python Exercises is obligatory and two out of three of the following courses must be passed:
     - AESM1320 Geology for Geo-Energy
     - AES1540-11 Electromagnetic Methods
     - AES1560 Advanced Reflection Seismology and Seismic Imaging

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
AESM1511	Field Geophysics and Signal Analysis with Exercises	6
CIE4606	Geodesy and Remote Sensing	5
AESM1320	Geology for Geo-Energy	5

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

code	subject	ECs
651-4079-00L	Reflection Seismology Processing	5
651-4087-00L	Case Studies in Exploration and Environmental Geophysics	3
651-4094-00L	Numerical Modelling for Applied Geophysics	5
651-4096-00L	Inverse Theory I: Basics	3
651-4096-02L	Inverse Theory II: Applications	3
651-4104-00L	Geophysical Fieldwork and Processing: Methods	2
651-4106-03L	Geophysical Field Work and Processing: Preparation + Field Work	7
651-4109-00L	Geothermal Energy	3
651-4240-00L	Geofluids	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 three of the following seven blocks must be passed:
  - 53.29463 and 53.14238 Geophysics Special Methods
  - 53.14570 and 53.50132 Geophysical Logging and Log Interpretation
  - 53.260000 Application of Geophysical Prospecting Methods in Earth and Environmental Science
  - 53.18482 and 53.29469 Hydrogeophysics and Engineering Geophysics
  - 53.42235 and 53.50028 Numerical Reservoir Engineering + Advanced Mathematical Modelling in Applied Geosciences
  - 11.47549 Numerical Methods for Geophysical Flows
  - 54.12000 Research Module in Applied Geophysics

code	subject	ECs
53.18667	Applied Structural Geology	3
53.29463	Geophysics special Methods: NMR	3
53.14238	Geophysics Special Methods: Spectral IP	3
53.14570	Geophysical Logging and Log Interpretation	5.5
53.50132	Fieldwork: Geophysical Logging and Log Interpretation	0.5
53.18482	Hydrogeophysics	3
53.2600	Application of Geophysical Prospecting Methods in Earth and Environmental Science	6
54.12000	Research Module in Applied Geophysics	6
53.31439	Data Analysis in Geoscience	3
54.34827	Mineral Exploration	3
53.32124	Petroleum System Modelling	3
53.23301	Sedimentary Basin Dynamics	3
53.29469	Engineering Geophysics	3
53.33690	Remote Sensing of Sedimentary Basins	3
53.45471	Portfolio Management and Prospect Evaluation	3
54.24346	Energy Resource Management	3
53.42235	Numerical Reservoir Engineering: Geophysical process simulation	3
53.50028	Advanced Mathematical Modelling in Applied Geosciences	3
53.24760	Microtectonics	3
53.46303	Image Processing and Microstructural Analysis	3
11.47549	Numerical Methods for Geophysical Flows	3
41.00220	Finite Elements in Fluids	3
81.18471	Economics of Technological Diffusion	3
12.02446	Statistical Classification and Machine Learning	4
12.05016	Statistical Classification and Machine Learning	2
53.32383	Underground Excavation	5.5
53.18658	Field Course: Underground Excavation (one day)	0.5
53.14584	Petrophysics	3
53.49932	Neotectonics and Earthquake Geology	3
53.30255	Seismic Interpretation in Geology	3

Delft/Aachen/Zürich

code	subject	ECs
AESM2506	Final Thesis Applied Geophysics	30

Article 10 The European Mining Course

1. European Mining Course:
   The specialisation European Mining Course (EMC), as laid down in this subsection, is taught at three partner universities:
   - Aalto University, Finland
   - RWTH Aachen, Germany
   - TU Delft

2. The study programme of the specialisation European Mining Course 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

First year, 2nd semester: Aachen:

code	subject	ECs
51.00002	Feasibility Studies of Mining Projects	5
51.49767	Reserve Modelling and Estimation	5
51.00005	Mine Design and Simulation	5
51.00003	Mine Waste	5
51.00008	Mine Ventilation	5
51.00031	Case Study – Mining Project	5

Second year, 3rd semester: Delft

code	subject	ECs
AESM1023	Computer Aided Mine Design and Optimisation	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

Second year, 4th semester: Delft

code	subject	ECs
AESM2010	Final Thesis	30

- Paragraph 2 -
Honours Programme

Article 11 Not applicable

Article 12 Not applicable

Article 13 Honours Programme

Article 13 has been moved to the TEACHING AND EXAMINATION REGULATIONS.

CONTENT

- Paragraph 3 -
Bridging Programme

Article 14 Transitional Programme for students with a Dutch Higher Vocational Institute Bachelor Degree

1. 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 Phenomena	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
WI1708TH3	Analysis 3	3
WI1808TH1	Linear Algebra (part 1)	3
WI1909TH	Differential Equations	3
CTB2400	Numerical Methods for Differential Equations	3

- Paragraph 4 -
Deviation from the Examination Programme

Article 15 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 16 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 indicated otherwise in the study guide.

Article 17 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 18 The frequencies, times and sequences of the exams

Article 18 has been moved to the TEACHING AND EXAMINATION REGULATIONS.

- Paragraph 6 -
Admission requirements for the Geo-Energy Engineering Project, Geoscience and Engineering Fieldwork and Final Thesis

Article 19 Access to Geo-Energy Project

The admission requirements for the Geo-Energy Project can be found in the study guide.

Article 20 Access to Geoscience and Engineering Fieldwork

The admission requirements for the Geoscience and Engineering Fieldwork can be found in the study guide.

CONTENT

Article 21 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 the CEG Student Portal. 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. 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.

3. 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 22 Working method of the Master Thesis 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 at least two committee members, which should include 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.

3. The date of approval of the work plan marks the official start of the Master Thesis Project. The daily supervisor will monitor the schedule.

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

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

6. 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).

7. 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.

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

9. 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.

10. 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.

11. 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.

12. 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.

13. The daily supervisor or a member of the assessment committee appointed in conjunction with the daily supervisor 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.

14. The daily supervisor 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 -
Transitional measures

Article 23 Transitional Rulings for Students of Cohort 2017-2018

1. In 2018-2019, AES1011 Matlab/Programming (2 credits), AES1300 Properties of Reservoir Fluids (3 credits) and AES1310-10 Rock Fluid Physics (3 credits) were replaced by AESM1300-18 Properties of Subsurface Fluids (4 credits) and AESM1310-18 Rock Fluid Physics (4 credits).

2. Students who did not manage to complete AES1300 have to follow AESM1300-18.

3. Students who did not manage to complete AES1310-10 have to follow AESM1310-18.

4. For students who did not manage to complete AES1011 an individual solution will be sought.

Article 24 Transitional Ruling MSc Petroleum Engineering and Geosciences track

1. If a student in the old MSc Petroleum Engineering and Geosciences track still misses credits after 2019-2020 the following transitional rulings 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 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	
AES0302	Image Analysis	1			
AES1304	Introduction to Petroleum Engineering and NAM Visit	3	AESM5405	Petroleum Exploration and Production	9
AES1320	Modelling of Fluid Flow in Porous Media	3	AESM5455	Numerical Methods for Subsurface Geoscience Simulation	9
AES1330	Drilling & Production Engineering	4	AESM5435	Production Science and Technology	9
AES1340	Reservoir Engineering	2	AESM5445	Dynamic Modeling and Optimisation	9
AES1350	Reservoir Simulation	2	AESM5455	Numerical Methods for Subsurface Geoscience Simulation	9
AES1360	Production Optimisation	3	AESM5435	Production Science and Technology	9
AES1500	Fundamentals of Borehole Logging	4			
AES1510	Geologic Interpretation of Seismic Data	3	AESM5465	Geological Interpretation of Geophysical Data	9
AES1520	Log Evaluation	2	AESM5460	Reservoir Characterization and Petrophysics	9
AES1802	Geological Fieldwork	3	AESM5470	Field Lab_common core	9
AES1820-2	Reservoir Characterisation & Development	4	AESM5460	Reservoir Characterization and Petrophysics	9
AES1890	Sedimentary Systems	3	AESM5320	Geology	5
AES1920	Geostatistics	2	AESM5330	Forward and Inverse Geomodelling	5
AES1990	Quantification of Rock Reservoir Images	1			
AES3020	Petroleum Geology	3	AESM5405	Petroleum Exploration and Production	9
AES1300-18	Properties of Subsurface Fluids	4	AESM5325	Physics for Geosystems	5
AESM3310-18	Rock Fluid Physics	4	AESM5325	Physics for Geosystems	5
WI4012a	Mathematics, Special Subjects	4	AESM5330	Forward and Inverse Geomodelling	5
AES1800	Exploration Geology (including Remote Sensing)	3	AESM5405	Petroleum Exploration and Production	9
AES1830	Reservoir Sedimentology	3	AESM5420	Advanced Sedimentary Geology	9
AES1840	Advanced Structural Geology	3	AESM5425	GeoMechanics and Structural Geology	9
AES1850	Geological Modelling	4	AESM5430	Simulation and Building of Stratigraphy	9
AES1860-5	Analysis of Sedimentary Data	3	AESM5475	Outcrop geology for subsurface characterization	9
AES1902	Reservoir Geological Fieldwork (Muricia)	6	AESM5475	Outcrop Geology for subsurface characterization	9

Article 25 When the rules do not provide

1. 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.

CONTENT

ANNEX

(IMPLEMENTATION REGULATION)

4TU MASTER DEGREE PROGRAMME
CONSTRUCTION MANAGEMENT AND ENGINEERING

2020
2021

THESE TEACHING AND EXAMINATION REGULATIONS
APPLY TO ALL STUDENTS OF THE COHORT 2020-2021

TU Delft

- Paragraph 1 -
Study programme

Article 1 Study load of the degree programme and of each of the study components it comprises

The study load of the Master programme is 120 credits. These 120 credits may by no means include any credits for courses that coincide with or were included in a previously passed Bachelor's examination.

Article 2 Composition of the study programme

1. The study programme is composed as follows:
   a. A set of compulsory courses as described in article 3 together comprising the 'core curriculum'.
   b. Depending on the BSc degree, students may need to do one 'synchronisation course', as described in article 4.
   c. A compulsory set of specialisation courses, as described in article 5 'specialisations'.
   d. The graduation thesis, as described in section 2 of this article.
   e. A set of elective courses, as described in article 6.

2. Students complete a graduation project that is worth 35 credits in total and consists of the following two components:
   a. CME5100 CME Master Thesis (Preparation), worth 5 credits, and
   b. CME5200 CME Master Thesis (Preparation), worth 30 credits.

3. Information about courses and admission requirements for courses can be found in the online study guide.

Article 3 Core curriculum: compulsory courses

The core curriculum consists of the following compulsory courses:

code	course	credits
AR8003TU	Legal and Governance	5
CME2300	Financial Engineering	4
CME4300	Engineering Asset Management	5
CME4200	Intercultural Relations	2
CME4000	Project Management	6
CIE4130	Probabilistic Design	4
CME1201	Collaborative Design and Engineering	5
CIE4030	Methodology for Scientific Research	3
CIE4120	Information Systems for the Construction Industry	4
WM0312CIE	Philosophy, Technology Assessment and Ethics*	4
WM0376TU	Ethics of Technological Risk*	5
TPM003A	Water Ethics*	5
CIE4510-20	Climate Change: Science & Ethics*	4

**) Students must choose at least one out of these four ethics courses.*

CONTENT

Article 4 Synchronisation Course

All CME-students of cohort 2020-2021, or later, may have to follow a synchronisation course depending on their bachelor degree or equivalent background:

1. Students with a Bachelor Bouwkunde/Architecture, or any equivalent Bachelor degree, with no proven prior knowledge of probability theory must follow:

code	course	credits
CME4130	Probabilistic Design Practical	2

Article 5 Specialisations

There are three distinct specialisations in the CME curriculum: **Engineering & Systems, Projects & People** and **Design & Integration**. Each specialisation has its own set of compulsory courses.

1. Students who choose the specialisation **Engineering & Systems** must complete the following courses:

code	course	credits
CIE4481	Systems Engineering Management	4
CME4500	Engineering Systems Optimisation	4
SPM9448	Methods for Risk Analysis and Management	5
CME4700	Operations Management for Construction*	4
EPA1316	Introduction to Data Science*	5
SEN9235	Game Design Project*	5

**) Students must choose at least one of these courses, but may also choose multiple courses.*

2. Students who choose the specialisation **Projects & People** have to complete the following courses:

code	course	credits
CME4100	Process Management	5
SPM9448	Methods for Risk Analysis and Management	5
CME2201	Dynamic Control of Projects	4
CME5000-19	Procurement of Complex Projects*	4
CIE5981	Forms of Collaboration in Civil Engineering*	4

**) Students must choose at least one of these courses, but may also choose both courses.*

3. Students who choose the specialisation **Design & Integration** have to complete the following courses:

code	course	credits
CME4100	Process Management	5
AR2R025	Urban (re)development game: Integrating Planning, Design and Property Development	10
CME4400	Entrepreneurial Engineering	4

CONTENT

Article 6 Electives

After following the compulsory core and the specialisation courses, CME students have up to 25 ECTS available to spend on elective courses depending on the chosen specialisation.

1. As part of the elective space, students may follow any CME specialisation course that is not already part of their chosen specialisation. In addition, students may include the following general electives in their elective space:

   a. Technical writing course
   Students who have not yet done an equivalent course during their Bachelor are allowed to follow the course:

code	course	credits
WM0201TU-Eng	Technical Writing	2

   b. Project course
   Students may choose only 1 of the following project courses in their elective space:

code	course	credits
CIE4061-09	Multidisciplinary Project	10
AR0139	MEGA	10* (15)
TUD4040	Joint Interdisciplinary Project	10* (15)
CME2100-11	Research Internship	10
CIE5050-09	Additional Graduation Work, Research Project	10

   **) Please note that TUD4040 and AR0026 only count for 10 credits towards the CME programme.*

2. Additional elective courses may be any Master's level course at a Dutch university or at an international university with which TU Delft has an exchange-contract, provided that the course is instrumental in deepening the CME knowledge or broadening the CME perspective.
   In addition, the following rules apply for the courses in the elective space:
   a. Graduate school courses are not allowed.
   b. Language courses are not allowed.
   c. At maximum only 1 course form the Athens program is allowed.

Article 7 Registration of Study Programme

1. All CME students must submit an Individual Study Plan (ISP) before the end of their first semester. The individual study plan provides an overview of the full MSc programme the student intends to follow and is worth a minimum total of 120 credits, including all compulsory courses, all specialisation courses and all electives. For the submission of the individual study plan, the following rules apply:
   a. Students of cohort 2019-2020, or of later cohorts, must submit their individual study plan using My Study Planning.
   b. Students of cohort 2018-2019, who started the Master CME between 1 January 2019 and 31 August 2019 and who have chosen to follow the curriculum of cohort 2019-2020, must submit their individual study plan using My Study Planning.
   c. All other students of cohort 2018-2019 and students of earlier cohorts must submit their individual study plan using an ISP1-form and follow the directions given on the ISP1-form.

2. All submitted individual study plans are assessed by the CME Director of Studies on behalf of, and in consultation with, the Board of Examiners. Approval of the individual study plan is granted when, in judgement of the Board of examiners, it is plausible that the proposed programme leads to the achievement of the learning objectives of the programme as formulated in article 4 of the Teaching and Examination Regulations.
   a. Students who have submitted their individual study plans using My Study Planning will be informed of the ISP evaluation through My Study Planning.
   b. Students who have submitted their individual study plans using an ISP1-form will be informed of the ISP evaluation by e-mail.
   If an ISP is not approved, the student must adapt the ISP based on the directions given in the evaluation and resubmit. Once approved, the individual study plan is registered in Osiris and used to monitor the students' progress, as well as to check whether the student has fulfilled all components to graduate.

3. During the course of the study programme, students may always request to change their specialisation, and thereby their specialisation courses, as well as request to change their elective courses:
   a. Students who have submitted their individual study plans using My Study Planning may request a change of their study programme through My Study Planning.
   b. Students who have submitted their individual study plans using an ISP1-form may request a change of their study programme using an ISP2-form.

   Any request for changes of the study programme are assessed by the CME Director of Studies on behalf of, and in consultation with, the Board of Examiners. Students are informed of the evaluation of any change request as formulated in article 7 section 2.

- Paragraph 2 -
Annotations

Article 8 Annotations

1. After prior approval by the Board of Examiners, students can opt for the following annotations:
   - Integral Design and Management
   - Railway Systems
   - Urban Planning and Engineering

2. The examination program for students who have opted for the annotation Integral Design and Management must include the following:

   a. At least 14 credits from a Master specialization-related bundle, choose from **i**, **ii**, **iii**, **iv** or **v**:

i. Hydraulic Engineering

code	course	credits
CIE3330	Hydraulic Structures 1	4
CIE4330	Ports and Waterways	4
CIEXXXX	Another engineering course*	min 3

ii. Building Engineering

code	course	credits
CIE3340	Building Structures I	4
CIE4210	Parametric Design	3
CIEXXXX	Another engineering course*	min 4

iii. Railway Engineering

code	course	credits
CIE4870	Structural Design of Railway Track	4
CIE4874	Elements of Railway Engineering	4
CIE5874	Railway Assets: Performance by Design	4

iv. Offshore Engineering

code	course	credits
OE44005	Introduction to Offshore Engineering	3
OE44120	Offshore Wind Farms Design	4
OEXXXXX	Another engineering course*	min 4

v. Another Master Specialization-related bundle*

**) to be determined with and approved by the IDM annotation coordinator.*

b. A Multidisciplinary Project (CIE4061-09) or a Research Internship (CME2100-11) worth 10 credits as mentioned in article 6 section 1 clause b.
   The Multidisciplinary Project or Research Internship must focus on the topic of integral design and management. The coordinator will test the hypothesis of the project and the way in which it has been tackled against the extent to which integral design and management issues have been integrated into the project.
c. A Master Thesis worth 30 credits in line with what is stipulated in article 2 section 2. The Master Thesis must partly focus on the topic of integral design management. The coordinator will test the hypothesis of the project and the way in which it has been tackled against the extent to which integral design and management issues have been integrated into the project.
d. Deviation from the list of electives may be possible, but only after the explicit approval of the IDM annotation coordinator.

3. Students who successfully complete one of the annotations listed in article 8 section 1 before 30 September 2022, receive a corresponding annotation certificate.

Please note: as of 30 September 2022, annotations will no longer be offered. Students can start an annotation programme at any time but if they finish the programme with an LOV date (last obligation fulfilled) after 30 September 2022, they will not receive an annotation certificate.

- Paragraph 3 -
Regulations for admission

Article 9 Regulations for Admission to MSc CME

1. Students with a Bachelor degree awarded by a Dutch higher vocational institute (“HBO”) can only be admitted to the MSc CME after finalising the HBO Bridging programme as mentioned in article 10.

2. Students with a Bachelor degree from either:
   - Delft University of Technology other than Bouwkunde/Architecture, Civiele Techniek/Civil Engineering or Technische Bestuurskunde/Systems Engineering, Policy Analysis & Management,
   - Eindhoven University of Technology other than Bouwkunde/Architecture, Technische Bedrijfskunde or Innovation Sciences, or
   - University of Twente other than Civiele Techniek/Civil Engineering or Technische Bedrijfskunde, have the following options to get admitted to the MSc CME:

   a. Bridging Minor
   To get admitted to the MSc CME with either aforementioned Bachelor degree, complete the minor:

code	course	credits
CT-MI-174	Project Management: from Nano to Mega (minor)	30

   b. Custom Bridging Programme
   Alternatively, students with either aforementioned Bachelor degree may request permission to do an individually tailored bridging programme in consultation with and or an equivalent set of courses, pending approval by the Director of Studies.

3. Student who have completed a HBO Bridging, or Premaster, Programme for CME at Eindhoven University of Technology, must additionally complete the following courses:

code	course	credits
WI1708TH3	Analysis, part 3	3
WI1909TH	Differential Equations	3

4. Student who have completed a HBO Bridging or Premaster Programme for CME at Twente University, must additionally complete the following courses:

code	course	credits
WI1807TH1	Linear Algebra	3
WI1909TH	Differential Equations	3

Article 10 HBO Bridging programme

1. To be admitted to the MSc CME, students taking part in the HBO bridging programme must complete all of the following courses at Delft University of Technology adding up to 37 credits:

code	course	credits
WI1708TH	Analyse 1, 2 and 3	9
WI1807TH1	Lineaire Algebra 1	3
WI1909TH	Differentiaalvergelijkingen	3
CTB1210	Dynamica & Modelvorming	5
WM0201TU-Eng	Technical Writing	2
CTB2001HBO	Computer Programming for HBO	3
WI2031TH	Kansrekening en Statistiek voor HBO-instromers	3
CTB3420	Integral Design of Infrastructure	4
CTB2420-17	Hydrologie	5

2. For the courses Analyse 1, 2 and 3, the weighted average must be at minimum a 6.0, while the minimum grade for each part is a 5.0. Neither the parts nor the weighted average are rounded off.

- Paragraph 4 -
Deviate from examination programme

Article 12 Deviate from the examination programme

The Board of Examiners may allow students to deviate from the examination programme.

Article 13 When the rules do not provide

Insofar as these Implementations Regulations do not provide for specific circumstances, for example when a course from an approved examination programme is no longer offered, the Board of Examiners will make a decision that is in line with the Implementation Regulations to every extent possible and the Board of Examiners will also take article 6 of the Rules & Guidelines into account.

- Paragraph 5 -
Examinations and Practical Exercises

Article 14 Number and frequency of the examinations and practical exercises

1. Written and oral (interim) examinations are taken immediately following the teaching period in which the education is provided.

2. At least one repeat opportunity is offered for each written (interim) examination. A timetable of these repeat examinations is published at the beginning of the study year.

3. Practical exercises can be done in agreement with the relevant timetables.

Article 15 Format of examinations

1. The (interim) examinations are taken in the manner prescribed for the relevant course in the digital study guide.

2. (Interim) examinations of courses, which are given by another programme to the CME programme are taken in the manner determined in or in accordance with the Education and Examination Regulations for CME.

Article 16 Participation in practical exercises

1. The educational programme Construction Management & Engineering consists a number of practical exercises in the form of design projects. Practical exercises can also be a part of a course, which is completed with a written exam. More information about these practical exercises can be found in the course descriptions. For the accomplishment of the master thesis, there is a digital and hardcopy guide available.[1]

2. Usually the opportunity to participate in a project or practical is offered only once per year. If – for reasons beyond his control – a student has not been able to participate in a project or practical in accordance with the regular schedule, the Examination Board will try – to the best of its ability – to enable the student still to carry out the project or practical.

CONTENT

1. *You can contact the CME secretary's office for the guide.*

- Paragraph 6 -
Admission to start the graduation project

Article 17 Conditions for admission to start the Master Thesis

1. Students may start the graduation project, as described in article 2 section 2, and thus start the course CME5100 CME Master Thesis (Preparation) (5 credits), if they have successfully completed all courses of the first year of the Master, as well as all courses of the first quarter of the second year of the Master, within the minimum amount of study time possible and in accordance with their individual study planning as registered in accordance with article 7.

2. Students who have not successfully completed all courses of the first year of the Master, as well as all courses of the first quarter of the second year of the Master, within the minimum amount of study time possible, may start the graduation thesis project, as described in article 2 section 2, and thus start the course CME5100 CME Master Thesis (Preparation) (5 credits), only if they meet the following requirements:
   a. The student has completed the synchronisation course, as described in article 4, and
   b. The student has completed CIE4030 Methodology for Scientific Research (3 credits), and
   c. and at least one of the following ethics courses:

code	course	credits
WM0312CIE	Philosophy, Technology Assessment and Ethics	4
WM0376TU	Ethics of Technological Risk	5
TPM003A	Water Ethics	5
CIE4510	Climate Change: Science & Ethics	4

   d. The student has completed at least 76 credits worth of courses out of the minimum 120 credits required for the study programme.

- Paragraph 7 -
Transitional Rulings

Article 18 Transitional rulings for students of cohort 2018-2019 and before

1. For students of cohort 2018-2019, or of earlier cohorts, who did not complete the course AR8002TU Legal and Governance (7 credits) in their compulsory programme, the following transitional ruling applies:
   a. Students must complete the course AR8003TU Legal and Governance worth 5 credits.
   b. If a student requires the 2 remaining credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.

2. For students of cohort 2018-2019, or of earlier cohorts, who did not complete the course CME1200 Collaborative Design and Engineering (7 credits) in their compulsory programme, the following transitional ruling applies:
   a. Students must complete the course CME1201 Collaborative Design and Engineering worth 5 credits.
   b. If a student requires the 2 remaining credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.

CONTENT

3. For students of cohort 2018-2019, or of earlier cohorts, who did not complete the course CME1210-14 Infrastructure Asset Management (7 credits) in their compulsory programme, the following transitional ruling applies:
   a. Students must complete either the course CIE4381 Engineering Asset Management worth 4 credits or the course CME4300 Engineering Asset Management worth 5 credits.
   b. The remaining 2 or 3 credits may be addressed by either one of the following courses:

code	course	credits
CIE4120	Information Systems for the Construction Industry	4
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4391	Quantitative Asset Modelling	4
CIE4481	Systems Engineering Management	4
CME4500	Engineering Systems Optimisation	4

   c. If, after fulfilling above requirements, a student still requires 2 or 3 additional credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.

4. For students of cohort 2018-2019, who started the Master CME between 1 January 2019 and 31 August 2019 and who have chosen to follow the curriculum of cohort 2019-2020, the following transitional ruling applies:
   a. Students with the course AR8003TU Legal and Governance (5 credits) in their compulsory programme are allowed to, but do not necessarily have to, complete the course AR8002TU Legal and Governance worth 7 credits instead.
   b. Students with the course CME1201 Collaborative Design and Engineering (5 credits) in their compulsory programme are allowed to, but do not necessarily have to, complete the course CME1200 Collaborative Design and Engineering worth 7 credits instead.

Article 19 Transitional rulings for students of cohort 2019-2020 and before

1. For students of cohort 2019-2020, or of earlier cohorts, who did not complete the course CIE4381 Engineering Asset Management (4 credits) in their compulsory programme, the following transitional ruling applies:
   a. In the academic year 2020-2021, two resits are offered for CIE4381 Engineering Asset Management worth 4 credits.
   b. Alternatively, students are allowed to complete the course CME4300 Engineering Asset Management worth 5 credits.

2. For students of cohort 2019-2020, or of earlier cohorts, who did not complete the course SPM8000 Project Management (7 credits) in their compulsory programme, the following transitional ruling applies:
   a. In the academic year 2020-2021, two resits are offered for SPM8000 Project Management worth 7 credits.
   b. Alternatively, students are allowed to complete the course CME4000 Project Management worth 6 credits.
   c. If a student requires the 1 remaining credit to reach the minimum total of 120 credits for the MSc, this credit may be addressed by any elective as described in article 6.

3. For students of cohort 2019-2020, or of earlier cohorts, who did not complete the course SPM8002 Process Management (7 credits) in their compulsory programme, the following transitional ruling applies:
   a. In the academic year 2020-2021, two resits are offered for SPM8002 Process Management worth 7 credits.
   b. Alternatively, students are allowed to complete the course CME4100 Process Management worth 5 credits.
   c. If a student requires the 2 remaining credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.

4. For students of cohort 2019-2020, or of earlier cohorts, who did not complete the course CME2200 Dynamic Control of Projects (4 credits) in their compulsory programme, the following transitional ruling applies:
   a. Students must instead complete the course CME2201 Dynamic Control of Projects worth 4 credits.

5. For students of cohort 2019-2020, or of earlier cohorts, with the course CIE4381 Engineering Asset Management (4 credits) in their compulsory programme and who have completed the course CTB3380-14 Infrastructure Management during their Bachelor or Bridging Programme, the following transitional ruling applies:

   a. Students must instead complete either one of the following courses:

code	course	credits
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4391	Quantitative Asset Modelling	4
CIE4481	Systems Engineering Management	4
CME4500	Engineering Systems Optimisation	4

   b. If, after fulfilling above requirements, a student still requires 2 or 3 additional credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.

6. For students of cohort 2019-2020, or of earlier cohorts, who did not complete the course WM0312CIE Philosophy, Technology Assessment and Ethics (4 credits) in their compulsory programme, the following transitional ruling applies:

   a. Students must complete either one of the following courses:

code	course	credits
WM0312CIE	Philosophy, Technology Assessment and Ethics	4
WM0376TU	Ethics of Technological Risk	5
TPM003A	Water Ethics	5
CIE4510	Climate Change: Science & Ethics	4

7. For students of cohort 2019-2020, or of earlier cohorts, who did not complete the course EPA1433 Intercultural Relations and Project Management (5 credits) in their compulsory programme, the following transitional ruling applies:

   a. Students must instead complete the course:

code	course	credits
EPA1434	Intercultural Relations and Project management	5

Article 20 Transitional rulings for cohort 2019-2020

1. For students of cohort 2019-2020, who did not complete the compulsory synchronisation course CME1220 Integration of Architecture and Engineering (3 credits) in their programme, the following transitional ruling applies:
   a. In the academic year 2020-2021, two opportunities will be offered to complete CME1220 Integration of Architecture and Engineering worth 3 credits.
   b. Instead of completing this course, and if the student requires the credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6 of the Annex TER CME 2020-2021.

2. For students of cohort 2019-2020, who did not complete the compulsory synchronisation course WI2180LR-II Probability and Statistics (4 credits) in their programme, the following transitional rulings apply:
   a. Students must complete the course CME4130 Probabilistic Design Practical worth 2 credits.
   b. If a student requires the 2 remaining credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.
   c. Alternatively, students are allowed to, but do not necessarily have to, complete one of the following courses:

code	course	credits
WI2180LR-II	Probability and Statistics	4
AESB1212	Probability and Statistics	4
CTB2200	Kansrekening & Statistiek	3
LB1211	Statistiek	3
WBMT2049 T1	Kansrekening en Statistiek - deeltentamen	3
WI2031TH	Kansrekening en Statistiek voor HBO-instromers	3

   d. Students who have completed the course CIE4130 Probabilistic Design are no longer required to complete a synchronisation course and may address any remaining credits required to reach the minimum total of 120 credits for the MSc by any elective as described in article 6.

CONTENT

Article 21 Transitional rulings for cohort 2020-2021

1. For students of cohort 2020-2021, with the course CME4300 Engineering Asset Management (5 credits) in their compulsory programme and who have followed the course CTB3380-14 Infrastructure Management during their Bachelor or Bridging Programme, the following transitional ruling applies:
   a. Students must instead complete either one of the following courses:

code	course	credits
CIE4170	Construction Technology of Civil Engineering Structures	4
CIE4391	Quantitative Asset Modelling	4
CIE4481	Systems Engineering Management	4
CME4500	Engineering Systems Optimisation	4

   b. If, after fulfilling above requirements, a student still requires 2 or 3 additional credits to reach the minimum total of 120 credits for the MSc, these credits may be addressed by any elective as described in article 6.

CONTENT

TEACHING AND EXAMINATION REGULATIONS (TER)

IN ACCORDANCE WITH ARTICLE 7.13 OF THE [DUTCH]
HIGHER EDUCATION AND RESEARCH ACT [WHW]

CORONA ADDENDUM

MASTER DEGREE PROGRAMME
CIVIL ENGINEERING

+

MASTER DEGREE PROGRAMME
APPLIED EARTH SCIENCES

+

4TU MASTER DEGREE PROGRAMME
CONSTRUCTION MANAGEMENT AND ENGINEERING

2020
2021

THESE TEACHING AND EXAMINATION REGULATIONS
APPLY TO ALL STUDENTS OF THE COHORT 2020-2021

TU Delft

Corona addendum to the TER MSc CE-AES-CME, 2020-2021

Article 2 section 4 is added

4. A written or oral examination can also be administered digitally and/or online. Where these Regulations refer to examinations, this also refers to digital and/or online examinations.

Article 3a section 6 is added

6. For the 2020-2021 academic year, in the context of the outbreak of COVID-19, students who were enrolled at a Dutch university or HBO (University of Applied Sciences) in the 2019-2020 academic year may be conditionally admitted provided that, on 31 August 2020, they:
   - have a deficit not exceeding 15 ECTS for the Bachelor's degree audit of the Bachelor's programme referred to in this article, or
   - have a deficit not exceeding 15 ECTS for completion of the bridging programme referred to in this article.

   If, on 31 August 2021, students have not met the admission requirements referred to in Section 1 of this article, they will be unenrolled from the degree programme.

Article 13 section 1 reads as follows

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.
   Contrary to the first sentence, for a written examination administered online remotely from the university, a registration period of no later than six calendar days before the examination date applies.

Article 13 section 6 is added

6. Sections 2 and 4 of this article do not apply to a written examination administered online remotely from the university.

Article 13 section 7 is added

7. If unforeseen circumstances or measures, for example as a result of COVID-19, necessitate a change in the form or manner of taking the examination, the original registration period will remain in full force, unless the Dean decides on a different registration period for the benefit of the student.

CONTENT

Article 14 section 1 reads as follows

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.
   If, due to unforeseen circumstances or measures, for example as a result of COVID-19, the form or manner of taking the examination changes, the rules on registration in the study guide will apply in full, unless the Dean decides to deviate from the manner or term for registration prescribed in the study guide.

Article 16 section 1 reads

1. Examinations are taken in the manner (oral, written or otherwise) described in the study guide.
   Unforeseen circumstances or measures, for example resulting from COVID-19, may require deviation from the prescribed form. If an examination is administered using online proctoring, this must take place in accordance with the TU Delft Online Proctored Examination Regulation.

Article 18 section 3 reads as follows

3. The oral examination is administered by at least two examiners.
   In the event of unforeseen circumstances or measures, for example as a result of COVID-19, the oral examination can be administered by a single examiner, in which case the oral exam is recorded with sound, with or without video image.

Article 29 section 4 is added

4. As a result of unforeseen circumstances or measures, for example as a result of COVID-19, the Dean may decide to deviate from these regulations, including the actual design of the education and any compulsory attendance requirements. This also means that it is possible to deviate from the provisions of the study guide.