

TEACHING AND EXAMINATION REGULATIONS (TER)

(from Article 7.13 of the Higher Education and Research Act)

2019-2020

MASTER'S DEGREE PROGRAMMES

**Engineering Policy Analysis (EPA)
Complex Systems Management (CoSEM)
Management of Technology (MOT)**

**DELFT UNIVERSITY OF TECHNOLOGY
Faculty of Technology, Policy and Management**

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Paragraph 1 - General

Article 1 - Applicability of the regulations

1. These regulations apply to the teaching and examinations of the Master's programmes
 - Complex Systems Engineering and Management (CoSEM),
 - Engineering Policy Analysis (EPA)
 - Management of Technology (MOT)hereinafter referred to as 'the programme'.
2. The programme is provided under the responsibility of the faculty Technology, Policy & Management of Delft University of Technology, hereinafter referred to as the faculty.

Article 2 - Concepts

1. The following concepts apply in this Regulation:
 - a. act: the Higher Education and Scientific Research Act (abbreviated to WHW), Bulletin of Acts and Decrees 593 and any amendments since its introduction.
 - b. degree audit: the test, 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;
 - c. negative binding recommendation on continuation of studies: the rejection linked to the recommendation on the continuation of studies at the end of the first year of enrolment as specified in Article 7.8b Section 3, first sentence -> not applicable for Master programmes
 - d. programme: the degree programme, as stipulated in Article 7.3a, Section 1, in the Act;
 - e. Osiris: the education information system;
 - f. 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,
 - carrying out a project such as an experimental design or a design/research assignment,
 - completing an internship,
 - participating in field work 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;
 - g. bridging programme: a deficiency programme aimed at moving up to a Master's degree programme, as stipulated in Article 7.30e or Article 7.57i of the Act; this includes the [Linkage programme](#) for CoSEM;
 - h. 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;
 - i. credit: credit in accordance with the European Credit Transfer System (ECTS); one credit equals a study load of 28 hours;
 - j. study guide: the digital guide for the degree programme containing specific information on the courses included in the degree programme (www.studiegids.tudelft.nl);
 - k. examination: investigation of the student's knowledge, insight and skills with regard to a subject, along with the assessment of that investigation;
 - l. track: major, as stipulated in Article 7.13, Section 2, Subsection b of the Act;
 - m. course: a unit of study within the programme, as stipulated in Article 7.3, Sections 2 and 3 of the Act, with which an examination is associated;
 - n. working day: Monday through Friday, with the exception of recognised holidays and the collective closure days;
 - o. brightspace: electronic learning environment.
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 examination', with the exception of Articles 19, section 1, first complete sentence and 22.

Paragraph 2 - Admission and prior education

Article 3 - Admission to the Master's degree programmes

(Art. 7.30b WHW)

BoS advisory powers

MSc Complex Systems Engineering and Management (CoSEM)

Degrees from Dutch higher education institutions

A. Specific university's Bachelor's degree

Individuals holding one of the following degrees are directly admitted to the programme under the condition they submit a CV and a motivation statement:

- BSc degree in *Technische Bestuurskunde* (TU Delft);
- BSc degree in *Technische Bedrijfskunde* (RUG, TU/e, UT);
- Another relevant BSc degree, to be assessed by the admission committee.

B. Other university's Bachelor's degree (not listed under section A)

Individuals holding one of the following degrees:

- monodisciplinary engineering BSc degree;
- BSc degree in a natural science;

may have access to the programme under the following conditions (exemptions may be granted by the admission committee):

- affinity with multi-disciplinary education, shown by about 10 EC in subjects such as policy, economics or law, or other relevant experience;
- successful completion of the online CoSEM Linkage Programme;
- submission of a CV and a motivation statement.

C. Bachelor's degree from an University of Applied Sciences ('HBO')

Individuals holding a multidisciplinary engineering bachelor degree may have access to the programme under the following conditions (exemptions may be granted by the admission committee):

- successful completion of a bridging programme;
- submission of a CV and a motivation statement.

Degrees from foreign higher education institutions

Individuals holding one of the following foreign bachelor degrees will be assessed on an individual basis by the admission committee:

- a good university's bachelor degree in the area of Science, Technology, Engineering and Mathematics with good grades on the key courses, to be assessed by the admission committee
- a good university's BSc degree in monodisciplinary engineering or natural science, with good grades on the key courses and an affinity with multi-disciplinary education, shown by about 10 EC in subjects such as policy, economy or law and successful completion of the online CoSEM Linkage Programme;

under the following conditions (exemptions may be granted by the admission committee):

- successful completion of the online CoSEM Linkage Programme;
- submission of a CV, two reference letters and a motivation statement;
- fulfilment of the TU Delft admission requirements for Cumulative Grade Point Average and English language proficiency.

MSc Engineering Policy Analysis (EPA)

Degrees from Dutch higher education institutions

A. Specific university Bachelor's degree

Individuals holding one of the following degrees are directly admitted to the programme under the condition they submit a CV and a motivation statement:

- BSc degree in *Technische Bestuurskunde* (TU Delft);
- BSc degree in *Technische Bedrijfskunde* (RUG, TU/e, UT);
- Another relevant BSc degree, to be assessed by admission committee.

B. Other university Bachelor's degree (not listed under section A)

Individuals holding one of the following degrees:

- BSc degree in Architecture and successful completion of a bridging programme ;

- BSc degree in Industrial Design and successful completion of a bridging programme or technical minor;
- BSc degree in the area of Science, Technology, Engineering and Mathematics to be assessed by the admission committee;

may have access to the programme under the following conditions (exemptions may be granted by the admission committee):

- proof of experience with modelling, simulation or programming,
- submission of a CV and a motivation statement.

C. Bachelor's degree from an University of Applied Sciences ('HBO')

Individuals holding a bachelor degree in degree in science, technology, engineering or mathematics may have access to the programme under the following conditions (exemptions may be granted by the admission committee):

- successful completion of a bridging programme;
- proof of experience with modelling, simulation or programming;
- submission of a CV and a motivation statement.

Degrees from foreign higher education institutions

- Individuals holding one of the following foreign bachelor degrees will be assessed on an individual basis by the admission committee:
- a good university's bachelor degree in the area of Science, Technology, Engineering and Mathematics with good grades on the key courses and proof of experience with modelling, simulation or programming, to be assessed by the admission committee

under the following conditions:

- submission of a CV, two reference letters and a motivation statement.
- fulfilment of the TU Delft admission requirements for Cumulative Grade Point Average and English language proficiency.

MSc Management of Technology (MOT)

Degrees from Dutch higher education institutions

A. Specific university's Bachelor's degree

Individuals holding one of the following degrees are directly admitted to the programme under the condition they submit a CV and a motivation statement:

- monodisciplinary engineering BSc degree;
- BSc degree in a natural sciences.

B. Other university's Bachelor's degree (not listed under section A)

Individuals holding one of the following degrees:

- BSc degree in Industrial Engineering;
- BSc in Architecture;
- BSc in System Engineering, Policy Analysis and Management;

may have access to the programme under the following conditions (exemptions can be made by the admission committee):

- proof of a technical minor within the BSc programme;
- submission of a CV and a motivation statement.

C. Bachelor's degree from an University of Applied Sciences ('HBO')

Individuals holding a bachelor degree in a technical field or in natural sciences may have access to the programme under the following conditions:

- successful completion of a bridging programme;
- submission of a CV and a motivation statement.

Degrees from foreign higher education institutions

Individuals holding one of the following foreign bachelor degrees will be assessed on an individual basis by the admission committee:

- a good university's bachelor degree in monodisciplinary engineering or natural sciences, with good grades on the key courses, to be assessed by the admission committee

under the following conditions:

- submission of a CV, two reference letters and a motivation statement.
- fulfilment of the TU Delft admission requirements for Cumulative Grade Point Average and English language proficiency.

Article 4 - University entrance examination

(Art. 7.29 Section 2 WHW)

Article remains empty -> not applicable for Master programmes

Paragraph 3 - Content and composition of the programme

Article 5a - Objective of the Master programme in CoSEM

(Art. 7.13 Section 2, Subsection c WHW)

BoS right of approval

1. The Master's programme in Complex Systems Engineering and Management intends to educate students as designers in socio-technical systems who master complex problems in a highly interconnected world. The programme has been designed to enable students to acquire multidisciplinary knowledge and practical skills needed for solving many contemporary, large-scale problems requiring intelligent combinations of technological, economic, legal and social interventions.

The students specialize in a specific technological track, i.e. Energy (Energy), Information & Communication (I&C) and Transport & Logistics (T&L). At the same time they are challenged to look beyond technical designs and address the social processes and the (emerging) institutional context that are crucial to understanding, creating and realizing designs.

After finishing this master, a CoSEM-engineer:

- is an expert in a specific technical domain, with regard to the engineering and management of large-scale systems and the related policy frameworks,
- is able to deeply understand the multi-actor complexity and anticipate the dynamics of socio-technical systems,
- is able to manage and to process big data, heterogeneous data and contested data,
- knows how to intervene in real-world decision-making processes to establish a coherent combination of institutional arrangements and technical system design
- is able to analyse and discuss the ethical aspects of complex problems and to integrate them in scientific work
- is able to conduct research on the engineering and governance of socio-technical systems.

2. Graduates must meet the final attainment levels for degree programme, as defined in Appendix 2.

Article 5b - Objective of the Master programme in EPA

(Art. 7.13 Section 2, Subsection c WHW)

BoS right of approval

1. The Master's programme in Engineering and Policy Analysis (EPA) educates talented students with a background in science, technology, engineering and mathematics as policy advisors for a wide range of technology and policy sectors, with the ultimate objective to improve the quality of long-term strategic policy-making. The study has an international character and an international orientation, which comes to expression in the choice of cases and projects.

Thematically the focus of the program is on understanding the character and intricacies of super-wicked problems: the Global Challenges; climate change, water security, cyber security, energy provision, international cooperation and development, world health, safety and security, etc.

EPA alumni should contribute to better informed (political) decision-making both in the public and the private sector. EPA graduates are competent in doing research and designing adaptive policies; in executing (big) data analytics, actor- and systems modelling and state of the art modeling and simulation of complex dynamic and adaptive systems.

EPA graduates are aware of the contemporary societal context in which they are operating and can operate effectively and responsibly in the political and policy-making context in which their work is embedded. EPA students therefore contribute to scientific work in the area of analytics, modelling and simulation and have the opportunity to apply their knowledge and skills in complex real-world settings, both in course work and thesis research projects with external commissioners.

2. Graduates must also meet the specific final attainment levels for each degree programme, as defined in Appendix 2

Article 5c - Objective of the Master programme in MOT

(Art. 7.13 Section 2, Subsection c WHW)

BoS right of approval

1. The Master programme in Management of Technology (MOT) educates students with a bachelor degree in engineering as technology managers, innovation managers, and analysts of technological markets. MOT graduates

either work as scientists or consultants but also as entrepreneurs in technology-based, internationally-oriented competitive business environments

The ultimate objective of the programme is to improve the quality of technology and innovation management in businesses and organizations through the development of responsible decision makers, professionals and leaders. Students contribute to scientific work in the area of MOT and have the opportunity to apply their knowledge and skills in complex real-world settings, such as advanced technology organizations, laboratories, and high-tech business ventures.

The programme deliberately aims at an international and diverse group of students. Students of MOT are all rooted in at least one of the engineering mono-disciplines as offered at universities of technology or schools of engineering. MOT students work together in order to combine scientific insights from the different engineering disciplines and to apply the diverse aspects of technology and innovation management. The programme focuses on the following core themes: (1) technology, innovation and organization, (2) technology, innovation and commercialization, (3) technology, innovation and engineering economics, (4) research and reflection.

2. Graduates must also meet the specific final attainment levels for each degree programme, as defined in Appendix 2

Article 6 - Track (MSc CoSEM)

(Art. 7.13 Section 2, Subsection b WHW)

BoStudies right of approval

The Master's degree programme CoSEM has the following tracks, the content of which can be found in Appendix 3.

- Energy
- Information & Communication
- Transport & Logistics

Article 7 - Composition of the programme and degree audits

(Art. 7.13 Section 2, Subsections a, e and g of the WHW)

BoS advisory powers (a); right of approval (e and g)

(Art. 7.13 Section 2, Subsection x WHW)

FSC right of approval, BoS advisory powers

1. The programme includes the Master's degree audit, with a study load of 120 credits. *Subsection e and g*
2. *Following approval from the two Boards of Examiners concerned, a student may take an individual double degree programme in which two Master's programmes are combined simultaneously to create a programme of at least 180 credits. Upon completion the student is awarded two Master's diplomas. The student must earn at least 60 unique credits for each Master's degree programme.*
3. *A course that was part of the Bachelor's degree programme that qualified a student for admission to the Master's degree programme may not be included in the Master's degree programme. If a compulsory component has already been completed in the aforementioned Bachelor's 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's degree programme, the student will select an alternative elective course. Subsection a*
4. *The Master's degree audit is concluded with a final test or assignment. This test or assignment demonstrates that the student possesses and is able to apply the knowledge, insight and skills acquired in the degree programme. Subsection a*
5. *The degree programme is described in Appendix 3. Subsection e and x*
The actual design of the education is elaborated in detail in the study guide. Subsection x

Article 8 - Form of the programme

(Art. (7.13 Section 2, Subsection i WHW)

FSC right of approval, BoS advisory powers

The programme is offered exclusively as full-time.

Article 9 - Language

FSC right of approval, BoS advisory powers

Teaching is in English, and the examinations are administered in English.

Article 10 - Honours Programme

FSC right of approval, BoS advisory powers

1. Based on the criteria stated in Section 6 and in the description of the Master's Honours Programme, students will be selected and admitted to the Master's Honours Programme by an Honours Coordinator nominated by the Director of Studies.
2. The Master's Honours Programme comprises at least 20 credits.
 - At least five credits must be completed in the institution-wide component of the Master's Honours Programme: the course 'Critical Reflection on Technology', UD2010, and
 - At least 15 credits must be completed in the faculty component of the Master's Honours Programme, the composition of which (including its content and options) is described in the Honours Programme.
3. All students selected for participation in the Honours Programme must submit their options for the faculty component for approval to the Honours Coordinator.
4. The Board of Examiners is responsible for assessing whether all the requirements of the Honours Programme have been met. Next to completion of the courses these requirements include that the programme is completed within the normal time set for the master's programmes measured from first enrolment. If a student follows a double degree programme as approved by the Board of Examiners the normal time set for this double degree programme constitutes the norm.
5. Any student who has successfully completed the Honours Programme will be awarded a certificate signed by the chair of the Board of Examiners and the Rector Magnificus.
6. To be admitted to the Master's Honours Programme, all three of the following must be satisfied:
 - a. Student's grade point average for the completed TU Delft Bachelor's degree is **7.5 or higher than 7.5**
 - b. Student is able to finish the Master's Honours Programme within the normal time set for the MSc programme;
 - c. Student has **exceptional motivation** to participate in the Programme

Article 11 - (Compulsory) participation in the programme

(Art. 7.13 Section 2, Subsection t WHW)

FSC right of approval, BoS advisory powers

1. All students are expected to participate actively in the programme for which they are registered.
2. If necessary, there will be an obligation to participate in practical exercises, with a view to admission to the related examination, without prejudice to the authority of the Board of Examiners to grant an exemption from this obligation, with or without imposing a substitute requirement.
3. Any supplementary obligations are described by component in the course description.

Article 12 - Programme quality assessment

(Art. 7.13 Section 2, Subsection a1 WHW)

BoS right of approval

1. The Director of Studies is responsible for the assessment of the quality of the degree programmes.
2. The manner in which the quality of the programmes is assessed is documented in the faculty's Quality Assurance Manual, which is submitted 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 assessment, the intended adjustments based on these outcomes and the effects of the actual adjustments.

Paragraph 4 – Registration for courses and examinations 2020-2021

Article 12a – Compulsory registration for courses (if applicable according to the studyguide)

FSC right of approval, BoS advisory powers

1. All students must register each semester for every course that they wish to or are obliged to take, subject to the further provisions of this article. Students must register for each course in Osiris.
2. Students who have not registered for a course according to the prescribed procedure are excluded from participation in that course.
3. Students who are participating for the first time in the first year of a Bachelor's, Master's or Bridging programme will be registered by the faculty for all compulsory courses in the first semester of the first academic year of the programme. The procedure for registering for electives for these students who are registering for the first-time is described in the study guide
4. Registration for courses takes place each semester during the registration period described below. Note that the registration period for a course with limited capacity as referred to in Section 6 of this article is one week shorter. When registering for a minor, other provisions apply.
 - a. The registration period for courses in the first semester is
 - from Monday (9:00) of teaching week 4.6 up to and including Sunday (23:59) of teaching week 4.7, and

- from Monday (9:00) up to and including Sunday (23:59) of teaching week 4.2 for a course as referred to in Section 6 of this article.
- b. The registration period for all courses in the second semester is
 - from Monday (9:00) of teaching week 2.3 up to and including Sunday (23:59) of teaching week 2.4, and
 - from Monday (9:00) up to and including Sunday (23:59) of teaching week 2.1 for a course as referred to in Section 6 of this article.

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

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

5. Students may register for courses with a total maximum study load of 40 credits per semester. A student who wishes to take more courses must submit a written request for this, giving their reasons, to the Director of Education of the faculty before the registration period as referred to in Subsection a or b in Section 4 of this Article, after first seeking advice from the academic counsellor. If permission for this is granted, the programme will arrange the registration for the extra course(s).
6. Before the start of the registration period the study guide is complete and final for the upcoming semester and will show which courses or parts of courses are a compulsory part of the programme. The Programme Director may restrict participation in a course within a programme in the following cases:
 - a. for a course with a maximum number of participants, admission is based on the criteria stated in the study guide, on the understanding that priority will be given to students for whom the course is a compulsory part of their programme.
 - b. for a course with an admission requirement, registration for the course is seen as a pre-admission which will be checked against the admission requirements stated in the prospectus before being finalised.
 - c. if participation in an elective is subject to further requirements as stated in the course description in the study guide.
7. Students who wish to register for a course outside of the official registration period on the grounds of exceptional personal circumstances may send a written request to Director of Education up to two weeks before the start of the semester, giving their reasons for this.
8. If a student has taken a course (or part of a course) for which an assessment will be given, without having registered for this course correctly or on time, any given assessment is invalid. The student may submit a written request to the Board of Examiners asking for a valid assessment and explaining their reasons. The Board of Examiners will only honour such a request in the event of exceptional circumstances.
9. Registration for a course does not count as registration for an examination. Students must register for examinations separately in accordance with the relevant provisions.

Article 12b – withdrawal from a course

1. Students may withdraw from a course at any time, via Osiris. Such a withdrawal is final.
2. A student who has withdrawn from a course and wishes to take it at a following opportunity must re-register for the course in accordance with the provisions of Article 12a.

Article 13 - Registration for written examinations

FSC right of approval; BoS advisory powers

1. Registration to participate in a written examination is compulsory and is done by entering the requested data into 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 Osiris. The request will be honoured providing that places are available in the room or rooms where the examination is scheduled to take place. Students receive examination tickets by email as confirmation of their registration.
3. In the event of circumstances beyond a student's control resulting in the student being unable to register for an examination, the Board of Examiners may nevertheless permit the student to participate in the examination.

4. Students who have not registered for the examination and are therefore not included on the list of examinees can report on the day of the examination to the invigilator beginning 15 minutes before the start of the examination until the actual start. They will be admitted to the examination room, in the order that they reported to the invigilator, 30 minutes after the start of the examination, if sufficient places are available. The loss of 30 minutes of examination time cannot be compensated. Students who have been granted late access to the examination will be added to the list of examinees. The student participates in the examination subject to the validation of entitlement to participate in the examination.
5. In the situation described in the previous section, if it is found that a student was not entitled to participate in the examination, the examination work will be deemed invalid, it will not be marked. The student may subsequently submit an appeal to the Board of Examiners, accompanied by reasons, requesting that the examination work that has been deemed invalid be declared valid and to have it assessed. The Board of Examiners will approve the request only in case of exceptional circumstances.

Article 14 - Registration for other examinations

FSC right of approval; BoS advisory powers

1. Registration for participation in an examination other than a written examination is compulsory, and it is done in the manner and within the term that is stated in the study guide for the relevant examination.
2. In special cases, the Board of Examiners make exceptions to the registration term stated in Section 1, but only in favour of the student.
3. Students who have not registered on time will not be allowed to participate in the examination. The Board of Examiners can nevertheless admit a student to the examination, but only in case of exceptional circumstances.
4. In the event of unauthorised participation in an examination, the Board of Examiners may declare the result invalid.

Article 15 - Withdrawal from examinations

FSC right of approval; BoS advisory powers

1. Students can withdraw from an examination through 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

(Art. 7.13 Section 2, Subsections h and l WHW)

FSC right of approval, BoS advisory powers

1. Examinations (oral, written or otherwise) are taken in the manner described in the study guide.
2. The study guide 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 will deviate from the provisions of this Article in favour of the student.
5. The lecturer or examiner will give the students ample time to prepare for an examination, giving them the opportunity to take note of examples of representative examination questions and answers published on brightspace.

Article 17 - Times and number of written examinations

(Art. 7.13 Section 2, Subsection j WHW)

FSC right of approval, BoS advisory powers

1. Two opportunities to take written examinations will be offered each academic year:
 - at the end of the teaching period in which the course is taught, and
 - in the fifth week or at the end of the next teaching period or during the resit period in the months of July and August.
2. An annual timetable is issued detailing when written examinations may be taken, and it is published before the start of the relevant teaching period.
3. Contrary to the provisions in Section 1, the opportunity to take the written examination for a course that is not taught in a certain academic year must be given at least once in that year.

Article 18 - Oral examinations

(Art. 7.13 Section 2, Subsection n WHW)

FSC right of approval, BoS advisory powers

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

Article 19 - Determination and announcement of results

(Art. 7.13 Section 2, Subsection o WHW)

FSC right of approval, BoS advisory powers

1. The examiner determines and registers the result of a written examination in Osiris 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 no later than 15 working days after the completion of the practical exercise at the designated time. In 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 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. 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 results

(Art. 7.13 Section 2, Subsection p WHW)

FSC right of approval, BoS advisory powers

1. Upon request, students will have the right to inspect their assessed work during a period of at least 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 or cognizance intended in Sections 1 and 2 will take place at a pre-established place and at a pre-established time.
4. Students proving that they were unable to appear at such an established place and time because of circumstances outside of their control will be offered another possibility, if possible within the period mentioned in Section 1. The place and times mentioned in the first sentence will be made known in good time.

Article 21 - Discussion of the results of examinations

(Art. 7.13 Section 2, Subsection q WHW)

FSC right of approval, BoS advisory powers

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.
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 and have motivated their requests, 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 in Sections 2 and 3.

Article 22 - Period of validity for examinations

(Art. 7.13 Section 2, Subsection k, Art. 7.10, Section 4 WHW).

FSC right of approval, BoS advisory powers

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 the first section, 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 (see: [link](#)).
3. In individual cases involving special circumstances, the Board of Examiners can extend periods of validity that have been limited based on the first section or further extend periods of validity that have been extended based on the second section.
4. If a final mark is calculated from partial exams, the period of validity of a partial exam is indefinite if this partial exam is registered in Osiris. The validity of partial exams not registered in Osiris are restricted to the current academic year, unless otherwise stipulated in the study guide.

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

(Art. 7.13 Section 2, Subsection r WHW)

FSC right of approval, BoS advisory powers

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

Article 24 - Periods and frequency of degree audits

(Art. 7.13 Section 2 WHW)

FSC right of approval, BoS advisory powers

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 are published before the beginning of the academic year.

Article 24a – invalidation of examination

(Art. 7.12 and 7.12b WHW)

FSC right of approval, BoS advisory powers

The Board of Examiners is authorised to declare invalid an examination or part thereof if a proper assessment of the knowledge, insight and skills of the student has not proved reasonably possible based on the examination or the part thereof. 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

(Art. 7.13 Section 2, Subsection m WHW)

FSC right of approval, BoS advisory powers

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:
 - form (e.g. enlarged version, 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, wider staggering 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 or loop systems and individual equipment for students with hearing impairments);
 - 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

Article 26 - Study support and Monitoring of student progress

(Art. 7.13 Section 2, Subsection u WHW)

FSC right of approval, BoS advisory powers

1. The Dean is responsible for providing study supervision and monitoring individual student progress 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 Osiris.
3. The Student Administration is responsible for ensuring that all students are able to review and check their results in the Osiris studentinformation system.

Article 27 - (Negative) binding recommendation on the continuation of studies

Articles remains empty -> not applicable for Master programmes

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 take precedence.

Article 29 - Amendments to the regulations

1. Amendments to these regulations are adopted separately by the Dean.
2. Amendments that are applicable to the current academic year will be made only if they do not harm students beyond what is reasonable.
3. Amendments to these regulations may not affect decisions that have been made prior to the amendment with regard to individual students in a way that harms these students.

Article 30 - Transitional measures

1. If the composition of the degree programme undergoes substantive changes, transitional measures will be established and published by the Dean.
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 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 additional opportunities for taking the examination in this course 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

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

Article 32 - Entry into force

These regulations enter into force on 1 September 2019.

Adopted by the Dean of the faculty on 29-08-2019.

APPENDIX 1 - to Article 3 of the TER (Admission)

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

The English language, through the successful completion of one of the following tests:

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

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

The following candidates shall be exempted from the requirement to pass an English language test:

- Nationals from the USA, UK, Ireland, Australia, New Zealand or Canada
- Applicants with a Dutch Pre-university (VWO) certificate
- Applicants who have obtained a higher professional education degree in an English-language programme.

Language level for individuals holding a foreign degree (d)

The English language, through the successful completion of one of the following tests:

- A TOEFL iBT (Test of English as a Foreign Language internet-Based Test) with an overall band score of at least 90 and a minimum score of 21 for each section, or
- an IELTS (academic version) with an overall Band score of at least 6.5 and a minimum score of 6.0 for each section, or
- Cambridge Assessment English:
 - C1 Advanced (Certificate of Advanced English) with an overall Band score of at least 176 and a minimum score of 169 for each section
 - C2 Proficiency (Certificate of Proficiency in English) with an overall Band score of at least 180 and a minimum score of 169 for each section

Certificates older than two years shall not be accepted.

The following candidates shall be exempted from the requirement to pass an English language test:

- Nationals from the USA, UK, Ireland, Australia, New Zealand or Canada
- Applicants who have obtained a Bachelor's degree in one of the countries mentioned.

APPENDIX 2 - to Article 5 of the TER (Final attainment levels)

References:

Meijers, A.W.M., van Overveld, C.W.A.M. and Perrenet, J.C., 2005, *Criteria for Academic Bachelor en Master Curricula*, TU Delft, TU/e & Universiteit Twente; available at alexandria.tue.nl/repository/books/570523E.pdf
TPM, 2015, *CoSEM redesigned*, internal report, 18 November 2015.

Final attainment levels of the Master programme CoSEM

A master's graduate in CoSEM

1. Is competent in one or more scientific disciplines / fields:

- Is a multi-disciplinary scholar, mastering theories and methods from the fields of systems engineering, institutional economics, law and management, with the ability to combine and/or switch between them to deal with complex problems;
- Can apply this body of knowledge when creating insight in the multi-actor complexity and can anticipate the dynamics of socio-technical systems;
- Is an expert in a specific technical domain (built environment and spatial development; energy; information and communications technology; transport and logistics), with regard to the engineering, management and governance of socio-technical systems and the related policy designs;
- Is able to reflect on the choice of methods and assumptions in scientific disciplines / fields, can identify knowledge gaps and decide how these need to be addressed by means of self-study or teamwork;

2. Is competent in doing research:

- Is able to formulate research questions and write a research proposal on complex issues in a highly interconnected world;
- Is able to choose appropriate quantitative and/or qualitative methods for conducting research on socio-technical systems;
- Can evaluate research and identify threats to the validity of scientific research, understand how these threats may affect the application of the research, and suggest possible remedies;
- Can contribute to the body of scientific knowledge through independent work;

3. Is competent in design:

- Is proficient in design methodologies for technical artefacts and institutional arrangements as well as able to develop innovative, integrative and effective interventions in real-world decision-making processes to establish a coherent combination of institutional arrangements and technical systems designs;
- Is able to identify dilemmas arising during the design process and can reflect on these in a systematic way and make justifiable design choices;
- Is able to structure and redefine complex problems from a multi-actor and socio-technical systems perspective;

4. has a scientific approach:

- Is able to cope with the uncertainty involved in multi-actor system behaviour, system context and futures, and can justify methods choices, while taking into account these uncertainties;
- Is able to critically reflect on existing theories and methods, and has skills to develop and validate these;
- Is able to report on the results of research and design processes in a scientifically sound way;

5. Possesses intellectual skills:

- Is competent in reasoning, reflecting and forming a judgment, and is able to recognize fallacies;
- is able to ask adequate questions and take a critical-constructive attitude when presented with complex real-life problems in the socio-technical realm;

6. Is competent in co-operating and communicating:

- Is able to work with and for others and has a sense of responsibility;
- Is able to work and take a leading role in international and interdisciplinary teams, in an academic, public or business environment;
- Is able to effectively communicate in writing or verbally and to use social media efficiently for research and communication;

7. Takes account of the temporal and the social contexts:

- Is familiar with the state-of-the-art knowledge, and with engineering, management and governance challenges in a specific technical domain;
- Is familiar with institutional factors that structure engineering and policy outcomes;
- Is able to analyse the societal and ethical consequences of scientific and technological developments, and to integrate this knowledge into their own (scientific) work;
- Takes into account the temporal context of the past and the future.

Final attainment levels of the Master programme EPA

A Master's graduate in EPA

1. Is competent in one or more scientific disciplines

- An EPA graduate has a thorough mastery of policy and politics, is skilled and experienced in intercultural management, and has a basic understanding of economic theories.
- An EPA graduate is skilled in (both quantitative and qualitative) modelling and simulation methods aimed at addressing global societal challenges following engineering principles and a multi-actor perspective.
- An EPA graduate apprehends the relationship of science and technology with governance and societal values.

2. Is competent in doing research

- An EPA graduate is able to formulate research questions on complex issues at the interface between natural and engineered systems, institutionalised values and social behaviour.
- An EPA graduate is proficient in the application of modelling and simulation methodologies in scientific research.
- An EPA graduate can design multi-methodological approaches to research that is fit for purpose.
- An EPA graduate can evaluate research within their discipline and identify threats to the validity of scientific research, suggest how these threats may confound the application of the research, and suggest possible remedies to address these threats.
- An EPA graduate can contribute to the body of scientific knowledge through independent work that has the potential for scientific publication.

3. Is competent in design

- An EPA graduate is able to develop engaging, innovative, integrative and adaptive, problem solving strategies and policies on the interface between natural and engineered systems, institutionalised values and social behaviour.
- An EPA graduate is able to structure and redefine complex societal issues from a multi-actor systems perspective.
- An EPA graduate is able to design and develop models and simulations for a wide range of engineering and societal challenges.
- An EPA graduate is able to design and develop strategic policy advices on the basis of analytical and modelling information

4. Has a scientific approach

- An EPA graduate has a systematic, multi-method approach characterised by the development and use of theories, models and domain knowledge.
- An EPA graduate knows the possibilities and limitations of a range of analysis and modelling techniques, and is able to select the appropriate methods for the problem.
- An EPA graduate has insight into the nature of science and technology, and their interrelations with governance and societal values.
- An EPA graduate is a reflective practitioner able to review and evaluate both theory and practice and able to learn and improve upon his or her own practice.

5. Possesses basic intellectual skills

- An EPA graduate is able to ask adequate questions and take a critical-constructive attitude when presented with complex real-life problems in the socio-technical realm.
- An EPA graduate can deconstruct policy arguments, thereby revealing the frames and assumptions that shape public debate.
- An EPA graduate is familiar with argumentation structuring techniques and can apply these for building convincing argumentations

6. Is competent in co-operating and communicating

- An EPA graduate is a catalyst of change and is able to work with and for others. He or she creates commitment for action, has a sense of responsibility, and demonstrates leadership.
- An EPA graduate is able to participate effectively in the scientific and public debate.
- An EPA graduate is able to work in an international, intercultural and interdisciplinary environment.
- An EPA graduate is capable in translating disciplinary and technical knowledge into actionable findings, practical policy advices and social understanding.

7. Takes account of the temporal and the social context

- An EPA graduate is familiar with the grand challenges that shape the future of our natural and built environments.
- An EPA graduate is familiar with the cultural and institutional factors that structure engineering and policy outcomes, and understands how these factors differ across the world.
- An EPA graduate is able to analyse the ethical and societal consequences of scientific and technological developments, and integrates this knowledge into their own work.

Final attainment levels of the Master programme MOT

A Master's graduate in MOT

1. Is competent in one or more scientific disciplines, in particular the management sciences, and is able to adapt and apply the concepts of these sciences in a high-tech engineering environment.

- Has a thorough mastery of parts of the relevant fields (as named in article 3) extending to the forefront of knowledge (latest theories, methods, techniques and topical questions).
- Looks actively for structure and connections in the relevant fields, and the connections between subfields.
- Has knowledge and skills in the way in which...
 - truth-finding and the development of theories and models
 - interpretations (texts, data, problems, results)
 - experiments, gathering of data and simulations
 - decision-making... take place in the relevant fields.
- Is able to reflect on standard methods and their presuppositions; is able to question these; to propose adjustments and to estimate their implications.
- Is able to spot gaps in his/her own knowledge, and to revise and extend it through study.

2. Is competent in doing research

- Is able to reformulate ill-structured research problems. Takes account of the system boundaries in this. Is able to defend the new interpretation against involved parties.
- Is observant, and has the creativity and capacity to discover in apparently trivial matters certain connections and viewpoints and put these into practice for new applications.
- Is able to produce and execute a research plan.
- Is able to work at different levels of abstraction. Given the process stage of the research problem, chooses the appropriate level of abstraction.
- Is able, and has the willingness to draw upon other disciplines in his or her own research.
- Is flexible in dealing with changes in the research process.
- Is able to assess research within the discipline on its scientific value.
- Is able to contribute to the development of scientific knowledge.

3. Has a scientific approach

- Is able to identify and take in relevant scientific developments.
- Is able to critically examine existing theories, models or interpretations in the area of his or her graduation subject.
- Has skills in, and affinity with the use, development and validation of models; is able consciously to choose between modelling techniques.
- Has insight into the nature of and differences between management and technical sciences and is able to distinguish and combine scientific fields.
- Is able to document adequately the results of research and thereby contribute to the development of the knowledge in the field, and is able to publish these results.

4. Possesses basic intellectual skills to reflect and decide

- Is able to critically reflect on his or her own thinking, decision making, and acting and to adjust these on the basis of this reflection
- Is able to reason logically within the field and beyond; both 'why' and 'what-if'-reasoning.
- Is able to recognize modes of reasoning (induction, deduction, analogy etc.) within the field. And is able to apply these modes.
- Is able to ask adequate questions, and has a critical yet constructive attitude towards analyzing and solving real life problems in the field.
- Is able to form a well-reasoned decision (and adopt effective strategies) in the case of incomplete or irrelevant data.
- Is able to take a standpoint with regard to a scientific argument in the field, and is able to assess this critically as to its value.
- Possesses numerical skills, and has an understanding of orders of magnitude.

5. Is competent in co-operating and communicating in an intercultural and multi-disciplinary environment

- Is able to communicate in writing in English about research and solutions to problems with colleagues, non-colleagues and other involved parties.
- Is able to communicate verbally in English about research and solutions to problems with colleagues, non-colleagues and other involved parties.
- Is able to debate about both the field and the place of the field in society.
- Is characterized by professional behavior. This includes: drive, reliability, commitment, accuracy, perseverance and independence.
- Is able to perform project-based work: is pragmatic.

- and has a sense of responsibility; is able to deal with risks; is able to compromise.
- Is able to work within an interdisciplinary and intercultural team.
- Is able to assume the role of team leader.

6. Takes account of the temporal, market and the social context

- Understands relevant developments in the history of the fields. This includes the interaction between the internal developments (of ideas) and the external (social) developments, and integrates this in scientific work.
- Is able to analyse and to discuss the social consequences (economic, social, cultural) of new developments in relevant fields and integrates these consequences in scientific work.
- Is able to analyse the consequences of scientific thinking and acting on the environment and sustainable development and integrates these consequences in work.
- Is able to analyse and to discuss the ethical and the normative aspects of the consequences and assumptions of scientific thinking and acting and integrates these ethical and normative aspects in work.

APPENDIX 3 - to Articles 7 and 16 of the TER (Programme)

General

1. Prerequisites

Some of the courses and projects have prerequisites. The prerequisites are mentioned in the study guide. See Appendix 4, Article 1 for the prerequisites of the Master Thesis Project.

2. Skills

Several courses and projects include skills. Skills will be graded by either pass or fail. No credits are linked to the skills, however, all skills must be passed in order to be able to graduate.

3. Optional courses may not overlap significantly in terms of content with any other unit already included in the study programme of the student concerned. In the event of doubt, the Board of Examiners decides.
4. A yearly list of rules and regulations concerning electives "Course and Examination Regulations Service Teaching" is published on the TPM- website-> Student portal -> Rules and guidelines -> Course and examination regulations.
5. Any changes made to the examination programme should be presented to the Board of Examiners.

Master Programme CoSEM

Composition CoSEM

1. The master's programme CoSEM, 120 EC, consists of the following components:
 - a. compulsory courses and projects, 75 EC as laid down under Specifications, Sections 3 and 5
 - b. track related courses, 30 EC as laid under Specifications, Sections 4 and 7.
Students choose at least one out of three tracks:
 - Information & Communication
 - Transport & Logistics
 - Energy & Industry
 - c. Master Electives Package of 15 EC
Students choose a Master Electives Package from:
 - Emerging technology-based innovation and entrepreneurship (+ annotation, see Appendix 4, Article 3)
 - Infrastructure and Environmental Governance (+ annotation, see Appendix 4, Article 3)
 - Economics and Finance
 - Advanced Modelling, Gaming and Design
 - Supply Chain Management
 - Cyber Security
 - ICT Design and Management (not for CoSEM I&C students)

These Master Electives Packages will take place with sufficient participation only.

2. The student may opt for the following annotation programmes of 15 EC as laid down in Appendix 4, Article 3:
 - Technology in Sustainable Development
 - Entrepreneurship
 - Infrastructure and Environmental Governance.
3. The student may be eligible for a special individual programme of 20 EC on top of the master's degree programme: Honours Programme Master, as laid down in Teaching and Examination Regulations, Article 10.

Specifications CoSEM

1. Students from the BSc-TB programme choose the corresponding track (as mentioned under Composition CoSEM, section 1, under b) they completed during their BSc-TB programme.
Students from another BSc programme must choose one out of four tracks as mentioned Composition CoSEM, section 1, under b. They do so in consultation with the study counsellor.
In both cases the track choice stays in principle fixed for the duration of the CoSEM programme.
2. The first year master's programme CoSEM consists of compulsory courses and projects and track related courses. The second year master's programme COSEM consists of compulsory courses and projects, track related courses and specialisation courses.
3. **First year compulsory programme**
 - SEN111A Introduction to Designing in Complex Systems (2 EC)
 - SEN1121 Complex Systems Engineering (5 EC)
 - SEN1131 Institutional Economics for Designing in Socio-technical Systems (3 EC)

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MSc CoSEM-EPA-MOT

SEN1141	Managing Multi-actor Decision Making (5 EC)
SEN1151	Law and Institutions (5 EC)
SEN1161	Design Project (5 EC)
SEN1211	Agent-based Modelling (5 EC)
OR:	
SEN1221	Statistics Analysis of Choice Behaviour (5 EC)
SEN1231	Mixed Research Methods for Multi-actor Systems (5 EC)
OR:	
SEN124A	Design in Networked Systems (5EC)
SEN131A	CoSEM Research Challenges (5 EC)

4. First year track programme

Students choose at least one out of three tracks as mentioned in Appendix 3. The tracks consist of the following courses:

Energy

SEN1511	Engineering Optimization and Integrating Renewables in Electricity Markets (5 EC)
SEN1522	Electricity and Gas: Market Design and Policy Issues (5 EC)
SEN1531	Design of Integrated Energy Systems (5 EC)
SEN1541	Sociotechnology of Future Energy Systems (5 EC)

Information & Communication

SEN1611	I&C Architecture Design (5 EC)
SEN1622	I&C Services Design (5 EC)
SEN163A	Fundamentals of Data Analytics (5 EC)
SEN1641	Integrated Design of I&C Architectures (5 EC)

Transport & Logistics

SEN171A	Advanced Evaluation Methods for Transport Policy Decision-making (5 EC)
SEN1721	Travel Behaviour Research (5 EC)
SEN173A	Analysis and design of freight and logistic systems (5 EC)
SEN1741	Innovations in Transport and Logistics (5 EC)

5. Second year compulsory programme

The second year consists of the following compulsory courses and projects:

SEN2321	CoSEM Master Thesis Preparation (5 EC)
SEN2331	CoSEM Master Thesis (30 EC)

6. Second year electives package programme

Students choose an electives package as listed under Composition, Section 1 under c. These electives packages will take place with sufficient participation only.

Students who intend to study abroad and students who start the programme in the second semester will have to compose a free electives package, to be approved by the Board of Examiners.

7. Second year track-elective programme

Accepted track electives
(for students cohort 2016 and later)

B&S

Accepted electives B&S tracks in Q1 + Q2

AR0097	Climate proof sustainable housing renovation (5 EC)
AR0880	Real Estate Valuation (7 EC)
SPM9730	Sustainable Innovation and Transitions (3 EC)
CIE4510	Climate Change: Science & Ethics (4 EC)
CIE5500	Water Laws and Organisation (3 EC)

Accepted electives B&S tracks in Q3 + Q4

WM0637SET	Economic Policy for Sustainable Energy (4 EC)
CIE5510	Water Management in Urban areas (4 EC)

ENERGY

Accepted electives Energy track in Q1 + Q2	
AE4T40	Airborne Wind Energy (3 EC)
SET3070	Thermochemistry of Biomass Conversion (4 EC,)
CH3792*	Introduction to Nuclear Science and Engineering (6 EC)
ET4107	Power Systems Analysis II (4 EC)
ET4376	Photovoltaic Basics (4 EC)
ME45000	Advanced Heat Transfer (3 ECT)
ME45180*	Energy Storage: Processes, Materials & Equipment (4 EC)
OE44005	Introduction to Offshore Engineering (3 EC)
OE44075*	Introduction to Ocean Energy Technologies (4 EC)

Accepted electives Energy track in Q3 and Q4	
AESM1306SET	Geothermal Energy and Applications (4 EC)
AP3341	Nuclear Reactor Physics (6 EC)
CIE5304	Waterpower Engineering (3 EC)
EE4545	Electrical Power Systems of the Future (4 EC)
ET4377	Photovoltaic Technologies (4 EC)
ET4378	Photovoltaic Systems (4 EC)
CH3222SET*	Energy Storage in Batteries (4 EC)

I&C

Accepted electives I&C track in Q1 + Q2	
SEN9311*	Digital Business, (5 EC)
CS4015	Behaviour Change Support Systems, (5 EC)
IN4252	Web Science & Engineering, (5 EC)
SPM5442	Cyber Risk Management, (5 EC)
SEN9720	Logistics and Supply Chain Innovations, (5 EC)
IN4191	Security and Cryptography, (5 EC)
GEO1002	Geographical Information Systems (GIS) and Cartography, (5 EC)
GEO1003	Positioning and Location Awareness, (5 EC)
GEO1005*	Spatial Decision Support for Planning and Crisis Management, (5 EC)
IN4392	Cloud Computing, (5 EC)
ID5311-19	Design innovation 4.0 in supply networks: transforming supply networks into automated eco systems, (6 EC)
ID5312*	Supply chain & network design (part 2), (3 EC), Q1

Accepted electives I&C track in Q3 + Q4	
MOT1531	Digital Business Process Management, (5 EC)
IN4315	Software Architecture, (5 EC)
IN4185	Globally Distributed Software Engineering, (5 EC)
IN4391	Distributed Systems, (5 EC)
IN4179*	Intelligent User Experience Engineering, (6 EC)
CS4145	Crowd Computing, (5 EC)

T&L

Accepted electives T&L track in Q1 + Q2	
CIE4811-18	Planning and Operations of Public Transport Systems (6 EC)
CIE5811*	Transport Safety (4 EC)
CIE5802-18	Advanced Transport Modelling (4 EC)
CIE5803-18	Railway Traffic Management (4 EC)
CIE5810-19	Traffic Safety (4EC)
CIE4330	Ports and Waterways 1 (4E)
AE4423	Airline Planning & Optimization (4 EC)
ME44000*	Intro Transport Engineering & Logistics (3 EC)
ME44206	Quantitative Methods for Logistics (5 EC)
SEN9710	Decision making in multimodal transport systems (5 EC)
SEN9720	Logistics and supply chain innovations (5 EC)
SEN9725	Supply Chain Gaming (5 EC)

Accepted electives T&L track in Q3 and Q4	
CIE5750*	Land Use and Transport Interactions in Cities: Empirical Analysis and Modelling (4 EC)
AR0093	Infrastructure and Environment Method Module (3 EC)
AR0551	People, Movement and Public Space (3 EC)
AE4446	Airport Operations (4 EC)
CIE5804-09*	Innovations in Dynamic Traffic Management (4 EC)

Master Programme EPA

Composition EPA

1. The master's programme EPA, 120 EC, consists of the following components:
 - a. compulsory courses and projects, 95 EC as laid down under Specifications EPA, Sections 2 and 3.
 - b. a specialisation, 15 EC as laid down under Specifications EPA, Section 4a.
Students choose a specialisation ('model specialisation') from:
 - Emerging technology-based innovation and entrepreneurship (+ annotation, see Article 4)
 - Infrastructure and Environmental Governance (+ annotation, see Article 4)
 - Economics and Finance
 - Advanced Modelling, Gaming and Design
 - Supply Chain Management
 - Cyber Security
 - ICT Design and Management
 - c. Free electives (10 EC) as laid down under Specifications EPA, Section 4b
2. The student may opt for the following annotation programmes of 15 EC as laid down in Appendix 4, Article 3:
 - Technology in Sustainable Development
 - Infrastructure and Environment
 - Entrepreneurship
3. The student may be eligible for a special individual programme of 20 EC on top of the master's degree programme: Honours Programme Master, as laid down in Teaching and Examination Regulations, Article 10.

Specifications EPA

1. The first year master's programme EPA consists of compulsory courses and projects. The second year master's programme EPA consists of compulsory courses,, specialisation courses and free elective courses.

2. **First year compulsory programme:**

EPA1101	Understanding International Grand Challenges (5 EC)
EPA1124	Policy Analysis of Multi-actor Systems* (5 EC) (obliged for non TB-Bachelors)
EPA1133	Ethics and Impacts of Global Interventions (5 EC)
EPA1144	Actor and Strategy Models (5 EC)
EPA1223	Macro Economics for Policy Analysis(5 EC)
EPA1315	Data Analytics & Visualization (5 EC)
EPA1323	Introduction to TPM Modelling (5 EC) (obliged for non TB-Bachelors)
EPA1333	Computer Engineering for Scientific Computing (5 EC) (obliged for TB-Bachelors)
EPA1341	Advanced System Dynamics (5 EC)
EPA1351	Advanced Discrete Simulation (5 EC)
EPA1361	Model-based Decision-making (5 EC)
EPA1424	Political Decision-Making***(5 EC)
EPA1433	Intercultural Relations and Project management**(5 EC)
XXXX	Technology (5 EC) elective for TB-Bachelors to be chosen from: <ul style="list-style-type: none">• CS4015 - Behaviour Change Support Systems• IN4334 - Analytics and Machine Learning for Software Engineering• SEN1211 - Agent Based Modelling of Complex Adaptive Systems• SEN1221 - Statistical Analysis of Choice Behaviour• SEN1522 - Electricity and Gas: Market Design and Policy Issues• SEN1622 - I&C Service Design• SEN1721 - Travel Behaviour Research

Three courses include one skills each

* EPA7010	Oral Presentation (skill)
**EPA7021	Academic Writing (skill)
***EPA7030	Interview techniques (skill)

3. **Second year compulsory programme:**

EPA2934	Preparation for the Master Thesis EPA (5 EC) for students who started in 2015 and earlier + 1 EC extra assignment)
EPA2942	Master Thesis EPA (30 EC)

4. **Second year specialisation programme and free electives**

- a. Students choose a specialisation as listed in under 1.b. These specialisations will take place with sufficient participation only.
Students who intend to study abroad and students who start the programme in the second semester will have to compose a free specialisation, to be approved by the Board of Examiners.
- b. EPA2112 Societal Challenge (10 EC) project for customer organisation offered to students studying in Delft/The Hague. Student can also change EPA2112 into individual elective courses (10 EC). (For students who started in 2015 or earlier: 9 EC.).
- c. Elective courses. may not be Bachelor courses or language courses and may not overlap significantly in terms of content with any other unit already included in the study programme of the student concerned. These elective courses have to be approved of by the Board of Examiners.

Master Programme MOT

Composition MOT

1. The master's programme MOT, 120 EC, consists of the following components:
 - a. compulsory courses and projects, 95 EC as laid down under Specifications MOT, Sections 2 and 3.
 - b. a specialisation, 15 EC as laid down under Specifications, Section 4a.
Students choose a specialisation ('model specialisation') from:
 - Emerging technology-based innovation and entrepreneurship (+ annotation, see Appendix 4, Section 3)
 - Infrastructure and Environmental Governance
 - Economics and Finance
 - Advanced Modelling, Gaming and Design
 - Supply Chain Management
 - Cyber Security
 - ICT Design and Management

These specialisations will take place with sufficient participation only.
 - c. Free electives (10 EC) as laid down under Specifications MOT, section 4b.
2. The student may opt for the following annotation programmes of 15 EC as laid down in Appendix 4, Section 3:
 - Technology in Sustainable Development
 - Entrepreneurship
3. The student may be eligible for a special individual programme of 20 EC on top of the master's degree programme: Honours Programme Master, as laid down in Teaching and Examination Regulations, Article 10.

Specifications MOT

1. The first year master's programme MOT consists of compulsory courses and projects. The second year master's programme MOT consists of compulsory courses, projects, specialisation courses and free electives.
2. **First year compulsory programme:**
The first year consists of the following compulsory courses:

MOT1003	Integration Moment (5 EC)
MOT1412	Technology Dynamics (5 EC)
MOT1421	Economic Foundations (5 EC)
MOT1435	Technology Strategy and Entrepreneurship (5 EC)
MOT1442	Social and Scientific Values (5 EC)
MOT1452	Inter- and intra-organisational decision making (5 EC)
MOT1461	Financial Management (5 EC)
MOT1524	Leadership & Technology Management (5 EC)
MOT1531	Digital Business Process Management (5 EC)
MOT1533	High Tech Marketing (5 EC)
MOT2312	Research Methods (5 EC)
MOT2421	Emerging and Breakthrough Technologies (5 EC)
3. **Second year compulsory programme:**
The second year consists of the following compulsory courses and projects

MOT2004	Preparation for Master Thesis (5 EC)
MOT2910	Master Thesis project (30 EC)
4. **Second year specialisation programme**
 - a. Students choose a specialisation as listed under Composition, Section 1 under b. These specialisations will take place with sufficient participation only.

Students who intend to study abroad and students who start the programme in the second semester will have to compose a free specialisation, to be approved by the Board of Examiners.

b. Students choose 10 EC worth of elective courses. These should not be Bachelor courses or language courses and should not overlap significantly in terms of content with any other unit already included in the study programme of the student concerned. In case of doubt, the Board of Examiners decides.

APPENDIX 4 - to Articles 7 and 16 of the TER (Remaining)

APP 4 - Article 1 - Master Thesis Project

1. A student can start the Master Thesis Project when all other study units of the curriculum have been completed.
2. If the requirement in subsection 1 has not been met, the student can be admitted to the graduation work only with the permission of the Board of Examiners. The student can only apply for this permission when the Master Thesis Preparation course has been completed and less than 10 EC of the curriculum remain. The Board of Examiners requires a positive advice from the academic counsellor.
3. The formation of the student's assessment committee is described in the Rules and Guidelines of the Board of Examiners, Article 27 (TPM website -> Student portal -> Rules and Guidelines TPM).
4. Thesis duration arrangement starting from academic year 2018-2019 for all students: when a student does not pass the first green-light meeting 17 working weeks after the kick-off meeting, the graduation committee may grant a second green-light meeting within 3 months. This extension must be motivated on the green-light form. Students who do not pass their second green-light meeting have to start with a new graduation topic and a new graduation committee, with the same duration arrangement. In case of special circumstances the Board of Examiners may deviate from the thesis duration arrangement in favour of the student.

Only for cohorts 2016-2017 and earlier:

- When the student worked on his/her master thesis project before 1 September, 2018, then:
 - these weeks are not taken into account when monitoring the thesis duration arrangement.
 - the monitoring and thesis duration arrangement will start from the 1 September, 2018 on.
- When the student starts his/her thesis in academic year 2018-2019 or later the thesis duration arrangement will be applicable.

APP 4 - Article 2 - Confidentiality of thesis and internship

Regarding possible confidentiality of a student's thesis and all external projects, the following rules apply:

1. Graduation presentations are public.
2. Theses and external project reports are public, unless companies/institutions, in writing and with motivation, request confidentiality because of sensitive information. A thesis/report can be put under embargo for a maximum of one year. If a company requests a longer period, company and student should agree on a separate public version of the thesis/report.
3. Lecturers, as reviewers of the thesis/report, always have access to all information necessary for an adequate evaluation of the thesis/report.
4. In case of sensitive information, lecturers should sign a declaration of confidentiality, for which a time limit can be set, in accordance with the terms of subsection 2.
5. Thesis reports (including confidential parts) should be accessible to members of the exam (graduation) committee and an accreditation committee, possibly after signing a declaration of confidentiality.

APP 4 - Article 3 - Annotations

1. Entrepreneurship

Students who are interested in entrepreneurship can opt for the Master Annotation Entrepreneurship programme, which trains students to become entrepreneurial. The examination programme for students who have opted for this annotation must at least include the following:

- WM4001TU Entrepreneurship Annotation Week (2 EC)
- a coherent set of courses in the field of entrepreneurship. The set should be composed in consultation with the Delft Centre for Entrepreneurship (DCE). It amounts up to 13 EC.
- extra attention to entrepreneurship, on top of regular graduation project activities, for example by writing a business plan or doing market research. For this extra effort DCE has formulated objectives and final attainment levels on which the extra part will be assessed.

An extra member will be added to the graduation committee who will supervise the student with regard to entrepreneurship. He/she should have expertise in the field of entrepreneurship and preferably be related to the TPM faculty. The additional member together with the DCE decides whether the annotation is granted.

2. Technology in Sustainable Development

Students who are interested in sustainable development might receive an annotation in Technology in Sustainable Development (TiSD) besides their MSc Degree. The examination programme for students who have opted for this annotation must at least include the following:

- WM0939TU Engineering for Sustainable Development (5 EC).

- Subjects within or outside the realm of the programme adding up to a total of at least 10 EC to be selected from the two clusters:
 - design, analysis and tools
 - organisation and society.
 At least 3 EC should derive from each cluster.
- The graduation work must focus on the topic of sustainable development. The referent will test the hypothesis of the graduation project and the way in which it has been tackled against the extent to which sustainable development issues have been integrated into the project.

3. **Infrastructure & Environmental Governance**

Students who are interested in potential employment in public or private organisations which deal with issues related to infrastructures and the environment can opt for the Infrastructure and Environment (I&E) annotation. The annotation is offered in cooperation with the Dutch Ministry of Infrastructure and the Environment. The examination programme for students who have opted for this annotation must at least include the following:

- SPM9160 Infrastructure and Environmental Governance (3 EC).
- a minimum of 12 EC technical courses which are complementary to the core curriculum of the student. The student chooses a relevant theme and selects technical courses that fit within this theme given their (track) background in consultation with the annotation coordinator.
- a project (5 EC) related to the selected theme . This project concerns a current realistic issue from the sector and is supervised by the TU Delft as well as by a supervisor from the Ministry of I&E.
- an I&E related graduation project (30 EC). The graduation project is carried out externally in an I&E related organisation (or internally on a relevant subject but with an external committee member). There is a list of organisations a student may choose from available at the annotation coordinator.

APP 4 - Article 4 - External Project

Students who are interested in doing an external project can only do so outside the regular study programme, and not by replacing the mandatory course courses. For an external project the track electives (CoSEM) or the elective space (EPA and MOT) of 10 EC can be used, course code spm5931 (internship – 10 EC).

Students who started in 2015 or earlier: students who are interested in doing an external project can do so by using the elective space of 9 EC. For an external project the course code spm5931 is used (internship – 10 EC), of a total of 10 EC elective space.

Students doing an external project will have to meet the following requirements (see also the study guide for the requirements of course SPM5931):

- Students are required to apply for approval to the Board of Examiners in advance
- One of the TPM instructors is involved in the project from start to finish
- An external supervisor will be appointed
- The external project will be finalized with a written report
- The external project will be assessed by the TPM examiner by filling out the required assessment form
- Students are required to remain registered as Master student at TU Delft during the entire project.

APPENDIX 5 - to Article 30 Transitions rules

Transitional rules Master programme CoSEM

First year track programme:

2019-2020:

Track Built Environment & Spatial Development was offered for the last time in 2018-2019

SEN1411 2 retakes are offered in 2019-2020

SEN1421 2 retakes are offered in 2019-2020

SEN1431 2 retakes are offered in 2019-2020

SEN1441 2 retakes are offered in 2019-2020

SEN1311 replaced by SEN131A, same course, new course code

SEN1241 replaced by SEN124A, same course, new course code

SEN1631 replaced by SEN163A, same course, new course code

SEN1711 replaced by SEN171A, same course, new course code

Transitional rules Master programme EPA

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Transitional rules Master programme MOT

2019-2020:

MOT1451 replaced by MOT1452, same course, new course code

MOT1531 replaced by MOT1531 Digital Business Proces Management (5 ECTS), same course, other title