

PROGRAM AND EXAMINATION REGULATIONS 2019-2020

FOR THE MASTER'S PROGRAMS IN

INNOVATION MANAGEMENT, OPERATIONS MANAGEMENT & LOGISTICS,

HUMAN-TECHNOLOGY INTERACTION AND INNOVATION SCIENCES

ACCORDING TO THE GRADUATE SCHOOL

The Board of the Department *Industrial Engineering & Innovation Sciences* of Eindhoven University of Technology ("TU/e"),

in view of Articles 9.5, 9.15, paragraph 1 under a, Article 7.13, paragraphs 1, 2 and 3, Article 9.38 under b, Wet op het hoger onderwijs en wetenschappelijk onderzoek' (WHW)

and Article 9.18, paragraph 1 under a, as well as Article 7.8b WHW,

in view of the approval/the advice of the Joint Program Committee of the Masters room on April 9, 2019,

in view of the approval/the advice by the University Council on April 23, 2019,

in view of the approval/the advice of the Department Council dated June 27, 2019,

in view of the approval/the advice of the Program Committee dated June 24, 2019

in view of the advice of the Examination Committee of July 4, 2019.

hereby establishes these Program and Examination Regulations (hereafter OER) for the Master's program in INNOVATION MANAGEMENT, OPERATIONS MANAGEMENT & LOGISTICS, HUMAN-TECHNOLOGY INTERACTION AND INNOVATION SCIENCES.

This OER enter into force on September 01, 2019 with exception of Articles 3.7 and 3.8 that enter into force on August 1, 2019 and are applicable to July 31, 2020

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H 1 GENERAL PROVISIONS

Art 1.1 Scope

1. These regulations apply to the teaching, examinations and final examinations of the Master's programs in Innovation Management, Operations Management & Logistics, Human-Technology Interaction and Innovation Sciences.
2. Stipulations of the Program and Examination Regulations of the Bachelor's program in question apply if Master's students take Bachelor's program study components.

Art 1.2 Definitions

- a. *competency*
an individual's ability to acquire, select and use the set of attitudes, skills and knowledge that is required to behave effectively in a specific professional, societal or learning setting.
- b. *Competency Assessment (CA)*
an assessment (as referred to in Article 7.10, paragraph 1 of the WHW) into the students' academic and professional competency development. The CA results in a verdict and is based on oral, written, digital and/or physical information and evidence.
- c. *course catalogue*
the part of OSIRIS in which information about study components is stored and displayed. For a study component mention is made of the teachers involved, the parts of the test and how these are weighed, among other things.
- d. *Education and Student Affairs (ESA)*
the service within TU/e where students and others can make use of a variety of services in the field of educational support.
- e. *examiner*
the officer responsible for an individual study component at TU/e who is appointed by the Examination Committee to assess students by means of examinations/CAs about the study component and to determine their results.
- f. *final examination*
the Master's examination of the degree program. This examination is successfully completed if all requirements have been met concerning the Master's degree program as a whole.
- g. *quarter*
the academic year is divided into four quarters. The start and end dates of these quarters is determined annually in the TU/e annual academic calendar.
- h. *subject specialist*
a teacher or similar representative with expertise concerning content who is not a student.

- i. mentor**
an assistant, associate or full professor appointed by the director of the Graduate Program, who supervises students as they put together their program of examinations/PDP and the related choices that need to be made .
- j. intra-university transfer student**
students who alter their enrollment in a certain degree program or pre-Master's program in the running academic year into an enrollment in another degree program or pre-Master's program at the TU/e.
- k. study component**
a component of the degree program aimed at achieving clearly defined goals concerning knowledge, insight, skills, and/or competency development with an associated examination or CA.
- l. OSIRIS**
The educational administration system in which the administration of students is maintained by the Departmental Center of Student Administration during the registration period.
- m personal development plan (PDP)**
a document aimed at planning and directing the development of students' competencies on a continuous basis. This is done by setting goals based on learning experiences reflection.
- n. practical exercise**
an educational activity in one of the following forms:
- writing a thesis,
 - undertaking a project or an experimental design,
 - carrying out a design or research assignment/project,
 - doing a literature study,
 - doing an internship,
 - making a (public) presentation,
 - taking part in fieldwork or an excursion,
 - conducting tests and experiments,
 - writing a position paper,
 - taking part in other practical educational activities designed to acquire specific skills.
- The educational activity in question, is part of a study component that is finalized with an exam or a CA, or a study component.
- o. professional skills**
non-disciplinary skills required in a professional environment by a successful Master's graduate
- p. response term**
the Examination Committee must decide within four weeks of having received a request, unless the request was made after the Examination Committee meeting held in June. Such requests are processed in the August meeting.

- q.** *pre-Master's program*
a program to eliminate deficiencies and after completion grants admission to a particular Master's program.
- r.** *pre-Master's student*
Student who are required to follow a pre-Master's program to eliminate deficiencies before being admitted to the Master's program.
- s.** *written*
where the term 'written' is used, digital communication (e-mail) or digital examinations are implied too.
- t.** *student*
a person taking a degree program at TU/e who is enrolled in the degree program this OER is related to, in accordance with the applicable TU/e Regulations 'Registration, Study Choice Check, Enrollment and Termination of Enrollment'.
- u.** *academic year*
the period that starts on September 1 and ends on August 31 of the following year.
- v.** *study workload*
the expected number of hours of study required to successfully complete a degree program or study component. The study workload is expressed in credits, where 1 credit is equals to 28 hours.
- w.** *transfer student*
students who, during the academic year prior to the academic year for which they registered, were enrolled at TU/e (internal transfer student) or elsewhere at an institution for higher education or university education (external transfer student)
- x.** *examination*
connected to a study component and concerns an investigation into the knowledge, insight and skills of students, as well as an assessment of the results of that investigation.
- y.** *working day*
one of the weekdays, i.e. Monday through Friday, with the exception of public holidays recognized by the Dutch government, and days on which the university is closed.
- z.** *WHW*
Higher Education and Scientific Research Act (WHW).
- aa.** The other terms used within these regulations have the meaning ascribed to them by law.

Art 1.3 TU/e Code of Conduct for Scientific Integrity

During enrollment students are held to the TU/e Code of Conduct for Scientific Integrity. In the first half of the program, the student must sign a statement¹ in the presence of the mentor indicating they shall act in accordance with the TU/e Code of Conduct for Scientific Integrity throughout the Master's program. This statement must be submitted to the departmental Center of Student Administration (henceforth departmental CSA) by the students. An attachment is added at the beginning of the graduation project stating that students will act in accordance with the TU/e Code of Conduct for Scientific Integrity. When the graduation work is completed, a statement is attached indicating that the work was realized in accordance with the code of conduct.

Violation of this code of conduct may be reported to the Complaints Committee for Scientific Integrity at TU/e. This Complaints Committee decides who shall process the incident: the Complaints Committee or the Examination Committee of the respective degree program that deals with fraud in accordance with the stipulations of the Regulations for the Examination Committee.

1.4 Honors academy

There is an honors program for students who want an additional challenge. The regulations pertaining to this program are incorporated in the TU/e Honors Academy Regulations for Master's Honors Tracks.

1.5 The digital learning environments

In various articles the names are used of the digital learning environments presently operative at the TU/e. If the digital learning environments are replaced during the course of the academic year, the new name of the learning environment should be read in the place of the old learning environment.

H 2 ADMISSION TO AND ENROLLMENT IN THE PROGRAM

Art 2.1 Admission and enrollment

1. Enrollment in the Master's degree program is open only to those who have direct access to this program based on a Bachelor's degree certificate, as specified in Appendix 1 under m, a proof of admission as referred to in paragraph 2 or who possess a statement issued by the Examination Committee of the Bachelor's program in question.
2. Proof of admission will be issued by the Department Board on the basis of the applicable TU/e Admission Regulations for Master's Programs.
3. Students who have followed a TU/e Bachelor's program or a TU/e pre-Master's program may be admitted to the Master's program on the first day of the month, provided they meet the requirements and have been enrolled at the university for a continuous period. TU/e students who have completed a competency-centered Bachelor's program and students who have completed a Bachelor's program at a different university are admissible for enrollment in the Master's program starting on September 1 and February 1 of each academic year, provided they meet the requirements. See also Appendix 1, under k.

Art 2.2 Following Master's program study components without admission/enrollment

In accordance with Article 5.2 of the Program and Examination Regulations for Bachelor's programs at TU/e, Bachelor's students or Pre-Master's students may participate in some study components of the Master's program (without actually being enrolled in the Master's program), provided the requirements have been fulfilled and permission to do so has been obtained from the Examination Committee of the relevant Master's program. See also Article 4.3, paragraph 2 of these Program and Examination Regulations.

H 3 STRUCTURE AND CONTENT OF THE DEGREE PROGRAM

Art 3.1 Learning outcomes of the degree program

1. General learning outcomes of the degree program

Masters of Science graduates of this degree program:

- are academically qualified to degree level within the domain of 'science engineering & technology',
- are competent in the relevant domain-specific discipline(s) at the scientific Master's degree level, as indicated in paragraph 2,
- are able to conduct research and design independently,
- have the ability and attitude to include other disciplines in their research, where necessary,
- have a scientific approach to complex problems and ideas,
- possess intellectual skills that enable them to reflect critically, reason and form opinions,
- have the ability to communicate the results of their learning, thinking and decision-making processes at an international level,
- are aware of the temporal and social context of science and technology (comprehension and analysis) and can integrate this context in their scientific work,
- in addition to a recognizable domain-specific profile, possess a sufficiently broad basis to be able to work or collaborate in an interdisciplinary and multidisciplinary context. In this context, multidisciplinary means being focused on other relevant disciplines needed to solve the design or research problem in question,
- have the ability and attitude to seek new potential applications, taking the social context into consideration.

2. Domain-specific disciplines
as intended by the previous paragraph, second point:
**Master Programs Innovation Management and Operations Management and Logistics:
Intended learning outcomes**

Domain specific learning outcomes:

Graduates of the MSc Innovation Management program are engineers who:

- have state-of-the art scientific knowledge of the design, behavior, planning and enhancing performance of innovation processes in technology-intensive and knowledge-intensive organizations. For this purpose graduates have multidisciplinary knowledge and insights stemming from the following disciplines: Engineering Economics, Information Systems, Operations Research, Organization Sciences, and Work & Organizational Psychology;
- have research skills to independently conduct studies meeting academic standards, in the domain of Innovation Management;
- are well-capable of modeling and (re)designing a complex business process, based on the results of a study, including specifications and required information.

Graduates of the MSc Operations Management & Logistics program are engineers who:

- have state-of-the art scientific knowledge of the design, behavior, planning and enhancing performance of operational processes in industrial and service organizations. For this purpose graduates have multidisciplinary knowledge and insights stemming from the following disciplines: Engineering Economics, Information Systems, Operations Research, Organization Sciences, and Work & Organizational Psychology;
- have research skills to independently conduct studies meeting academic standards, in the domain of Operations Management & Logistics;
- are well-capable of modeling and (re)designing a complex business process, based on the results of a study, including specifications and required information, and are capable of applying this knowledge and insight into operational, consulting, and managerial jobs in industry.

General scientific learning outcomes:

Graduates of the MSc Innovation Management program have an academic attitude, design skills, and a set of communicative and social skills. Because of this they are capable of:

- reflecting and creatively solving problems. They understand their own (and the organizational) learning process and have skills in this domain;
- communicating clearly and unambiguously both in industry and in academia, with non-specialists and specialists in the domain. Therefore, they have adequate social and communication skills;
- operating independently as well as in (multidisciplinary) teams;
- being aware of the social context they work in and social impact of their work.

Graduates of the MSc Operations Management & Logistics program are engineers who have academic skills, design skills, and communication and cooperation skills. They:

- are capable of applying their knowledge and insight into research & development jobs in academia;
- are capable of applying their knowledge and insight into operational, consulting, and managerial jobs in industry;
- are capable of operating independently and in teams, at an academic level;
- can critically reflect on their own thinking, decisions and actions and behave systematically;
- operate effectively and efficiently in a multidisciplinary context;
- communicate clearly and unambiguously, both in industry and in academia, with non-specialists and specialists in the domain;
- are aware of the relative importance of knowledge of scientific disciplines and the societal impact of scientific knowledge (and vice versa);
- possess the necessary learning skills to enable them to enter subsequent programs requiring substantial independence, such as PhD programs or postgraduate professional programs or courses;
are capable of independently identifying and supplementing any lack of knowledge.

Master Programs Human-Technology Interaction and Innovation Sciences: Intended learning outcomes

Following the defined competence areas, the intended learning outcomes of the MSc program Human-Technology Interaction are specified as follows in terms of knowledge and skills of the graduates:

1. *Competent in scientific disciplines*
 - a. Knowledge of and insight into technological systems and their components in a specialized area of their background engineering domain
 - b. Thorough knowledge and understanding of concepts, theoretical frameworks and methodologies of psychology and the complex human-technology interactions.
 - c. Thorough knowledge of and advanced skills in the techniques of observation, data collection and analysis techniques in the human-technology domain, and an ability to critically reflect on the scope and limitations of these methods
2. *Competent in doing research*
 - a. Ability to formulate research problems in terms of concepts and theories of psychology and human-technology interactions
 - b. Ability to independently develop and execute a research plan.
 - c. Ability to contribute independently to the development of scientific knowledge in the area of the human-technology interactions.
 - d. Ability to identify and analyze problems typical for human technology interaction by integrating technological and psychological perspectives.
 - e. Ability to appraise relevant scientific evidence on its usefulness in addressing research problems.
 - f. Consolidate the understanding of the ethics of psychological / user research, and has both the ability and attitude to adhere to these rules.

3. *Competent in designing*
 - a. Ability to formulate design problems in terms of concepts and theories of psychology and human-technology interaction.
 - b. Ability to develop and execute a sound plan for formulating design requirements.
 - c. Ability to integrate existing knowledge, or identify gaps therein, on technological requirements for human-technology interactions in the (re-)design of (requirements for) products or systems.
 - d. Ability to integrate the technological and psychological domains, merging knowledge, methods and concepts.
 - e. Ability to make decisions with respect to design requirements where they pertain to the interaction between the user and the system or product, and to justify these decisions in a systematic manner.
4. *A scientific approach*
 - a. Ability to document the result of psychological or user requirement research for the development of knowledge within the field and beyond.
 - b. Ability to apply and critically examine existing theories, concepts and models in the human-technology interaction domain in a systematic manner.
 - c. Ability to look beyond the borders of a specific discipline, to be sensitive to the relative contributions of various disciplines and to understand the knowledge demands of a specific discipline.
 - d. Understanding of the practices and principles of science, and knowledge of current debates about this.
5. *Basic intellectual skills*
 - a. A reflective attitude, with an ability to critically and independently reflect on own thinking, decision making, and professional behavior.
 - b. A critical mindset and the ability to ask constructive questions regarding complex problems in the field.
 - c. Ability to read and write scientific texts and build a solid argumentation.
 - d. Ability to think in abstract terms, including the ability to develop formal models of phenomena and processes in the domain.
6. *Competent in co-operating and communicating*
 - a. Capability of reporting and communicating the results of one's learning and decision making –including one's research outcomes --, both verbally and in writing, with academics and engineers in various domain, users, and the general public
 - b. Ability to recognize and deal with differences in work practices between scientific disciplines and academics from other cultural backgrounds.
 - c. Ability to take a leading role in multi- or interdisciplinary teams of engineers and academics.
 - d. Ability to listen, read, talk and write in English on a professional level
7. *Takes account of the temporal, technological and social context:*
 - a. Ability to reflect on the relation between the use of scientific knowledge and technology, the implicated social, normative and ethical issues, and the way in which knowledge and technology development is influenced by its social and historical context, and the ability to integrate such relations and implications in their professional work.
 - b. Understanding of the different roles of engineers and related professionals in society, and the ability to determine one's own place as a professional in society.

Following the defined competence areas, the intended learning outcomes of the MSc program Innovation Sciences are specified as follows in terms of knowledge and skills of the graduates:

1. *Competent in scientific disciplines*
 - a. Advanced knowledge of and insight into technological systems and their components in a specific technology domain.
 - b. Thorough understanding of concepts, theoretical frameworks and methodologies of innovation sciences extending to the forefront of knowledge
 - c. Thorough multidisciplinary knowledge integrating innovation sciences knowledge with technological knowledge in relevant domains, and the ability to critically reflect on the scope and limitations of this knowledge.
 - d. Thorough knowledge of and advanced skills in the techniques of observation, data collection and analysis techniques in the innovation sciences domain, and an ability to critically reflect of the scope and limitations of these methods.
2. *Competent in doing research*
 - a. Ability to formulate research problems in terms of concepts and theories of innovation sciences.
 - b. Ability to independently develop and execute a research plan.
 - c. Ability to contribute independently to the development of scientific knowledge in one of the areas of the innovation sciences.
 - d. Ability to identify and analyze problems typical for the innovation sciences, by integrating technological and social sciences perspectives.
 - e. Ability to appraise relevant scientific evidence on its usefulness in addressing research problems.
3. *Competent in designing*
 - a. Ability to independently translate the outcomes of innovation sciences research into design, policy or strategy recommendations for innovation in existing and new socio-technical systems.
 - b. Ability to independently identify both the social and the technical implications of innovation sciences in design recommendations.
4. *A scientific approach*
 - a. Ability to apply and critically examine existing theories, concepts and models in the innovation sciences domain.
 - b. Ability to look beyond the borders of a specific discipline, to be sensitive to the relative contributions of various disciplines and to understand the knowledge demands of a specific discipline.
 - c. Ability to use a systematic approach characterized by the consistent application of existing theories, concepts and models in innovation sciences, and knowledge of current debates about this.
5. *Basic intellectual skills*
 - a. A reflective attitude, with an ability to critically and independently reflect on own thinking, decision making, and professional behavior.
 - b. A critical mindset and the ability to ask constructive questions regarding complex problems in the field.
 - c. Ability to read and write scientific texts.
 - d. Ability to think in abstract terms, including the ability to develop (formal) models of phenomena and processes in the domain.

6. *Competent in co-operating and communicating*
 - a. Capability of reporting and communicating the results of one's learning and decision making – including one's research outcomes --, both verbally and in writing, with academics and engineers in various domain, users, and the general public
 - b. Ability to recognize and deal with differences in work practices between scientific disciplines, and academics from other cultural backgrounds.
 - c. Ability to take a leading role in multi- or interdisciplinary teams of engineers and academics.
 - d. Ability to listen, read, talk and write in English on a professional level.
7. *Takes account of the temporal, technological and social context*
 - a. Ability to reflect on the relation between the use of scientific knowledge and technology, the implicated social, normative and ethical issues, and the way in which knowledge and technology development is influenced by its social and historical context, and the ability to integrate such relations and implications in their scientific work.
 - b. Understanding of the different roles of engineers and related professionals in society, and the ability to determine one's own place as a professional in society.

Art 3.2 Requirements specific to the degree program

1. With reference to the program, Appendix 1 includes the following:
 - a. the content of the degree program and the corresponding examinations
 - b. the content of the tracks,
 - c. the organization of the practical exercises,
 - d. the study workload of the program and of each of the accompanying study components,
 - e. the number and the prerequisites of the examinations or CAs, and the times at which they can be taken,
 - f. whether the program is offered as a full time and/or part time program,
 - g. whether examinations or CAs are to be taken orally, in writing or otherwise,
 - h. where necessary, that successful participation in examinations or a CA is a condition for admission to other examinations,
 - i. where necessary, the obligation to take part in practical exercises (as part of a study component) with a view to taking the examination or CA in question,
 - j. the study components from which the students must choose in order to complete the elective part of the degree program,
 - k. the number of opportunities to join the Master's program,
 - l. the requirements for issuing a certificate of admission,
 - m. Bachelor's degree certificates that provide direct access to the Master's program,
 - n. the transitional arrangements as referred to in Article 7.1,
 - o. the way in which education in the degree program is evaluated and the results are made available to the relevant official bodies. The evaluation takes place through periodic course evaluations at the very least and by other degree program evaluations within the agreed TU/e formats.
2. Appendix 2 contains the rules and procedures for pre-Master's programs.
3. Appendix 3 describes the contents of the pre-Master's program.
4. Appendix 4 provides information regarding the regulations pertaining to the pre-Master's program.
5. The appendices constitute an integral part of these Regulations.

Art 3.3 Language

The program is delivered entirely in English and the examinations, CAs and final examinations are administered in English.

Art 3.4 Structure of the degree program

1. The program is a coherent set of study components designed to achieve the learning outcomes of the program.
2. The program has a study load of 120 credits and is divided into various study components as stated in the applicable Guideline Revision of Master's Programs Graduate School. Appendix 1 contains details on the degree program (see Article 3.2, paragraph 1, part a, in conjunction with Appendix 1, part a).
3. The program includes a diagnostic test of the students' professional skills at the start of the program and a subsequent mentoring meeting during the first or second quarter.

Art 3.5 Mentor

1. Students will receive program-related supervision from a mentor from the degree program for the duration of the program. Students will be linked to a mentor no later than five months after the degree program has commenced, unless those students request acknowledgement of special circumstances by the Examination Committee.
2. A mentor:
 - supervises students in their choice of specialized elective study components and gives advice,
 - supervises students as they compose the rest of the program of examinations/PDP,
 - within the framework of developing professional skills, meets with the students to discuss the results of the professional skills diagnostic test (see Article 3.4, paragraph 3) and the professional skills development plan they have developed.
3. If students have not chosen to include a minimum of 15 credits worth of international experience in their program of examinations, they must discuss this with their mentor.

Art 3.6 Program of Examinations

1. A program of examinations is a coherent set of study components that makes up students' degree programs. In competency-centered programs the program of examinations is operationalized in the PDP of students.
2. Students must choose the specialized study components and free elective study components at Master's level included in Appendix 1 under j. The specialized elective study components are only added to the program of examinations/PDP after advice from the mentor. Within the free electives, a maximum of 15 credits of Bachelor's study components may be used to compensate deficiencies (homologation study components).

3. Students must submit all electives and other study components that will make up their program of examinations/PDP to the departmental CSA) before they start their graduation project⁵. The graduation project is also included in the program of examinations. At the same time, students must submit their program of examinations including the advice issued by the mentor (as referred to in the previous paragraph), to the Examination Committee for approval. The Examination Committee must reach their decision within the response term and must indicate whether students may commence with their graduation project.
4. A decision to deny approval may not be made before students have been given the opportunity to be heard by the Examination Committee.
5. Ultimately nine months after the start of his/her Master's program, every student must submit his/her provisional program of examinations, signed by the mentor, to the Examination Committee for information. When composing this program, the student should consult with the mentor to ensure that sufficient cohesion is achieved.
6. The Examination Committee checks the program of examinations for coherence and quality as well as to ensure it meets the requirements for a Master's program. This involves the advice of the mentor.

Art 3.7 Registering for and deregistering for study components

1. A student can register for a maximum of 20 study credits of study components per quarter and take examinations or CAs in those study components. A student who wishes to register for more study components must obtain permission from the Examination Committee.
2. For study components there is a registration deadline of up to five working days before the first quarter and twenty working days before the second, third and fourth quarter. For students who wish to register for study components that are completed by means of a CA, registration must take place no later than June 1 for the first quarter and no later than December 11 for the third quarter through OSIRIS.
3. If students decide not to participate in a study component for which they have registered, they are required to deregister in OSIRIS before the start of a quarter.

Art 3.8 Registering for a study component after the registration term

1. A student who fails to register for a study component within the period specified in Article 3.7 shall not be allowed to participate in the study component, unless the student has paid administration costs totaling €20 per study component no later than 5.00pm on the Thursday prior to the beginning of teaching in the first quarter, or no later than fifteen working days prior to the beginning of teaching in the second, third or fourth quarter. After payment of the administration costs students are immediately registered unless the maximum capacity for a course has been reached.

2. In cases of force majeure, at the discretion of the ESA Director, it may be decided that the student who reports after the terms mentioned in paragraph 1 may nevertheless be registered for a study component. In addition, the ESA Director may waive the administration costs stated in paragraph 1.
3. In the case of a situation as described in Article 3.7, paragraph 3, no supplementary administration costs will be incurred.
4. In the case that (in the end) due to force majeure, the student cannot participate in a study component for which administration costs have already been paid, the fee will be refunded.

Art 3.9 Flexible degree program

1. A student who is enrolled in a degree program may select study components from a university to compose a curriculum that involves a final examination, as referred to in Article 7.3h of the WHW.
2. A substantiated request for permission to take a flexible program must be submitted to the Examination Committee of the program in which the student is enrolled no later than twelve weeks before the relevant teaching begins.
3. The Examination Committee shall decide on the request within the response term. If necessary, at the request of the Examination Committee, the Executive Board can delegate this decision to the Examination Committee of another program.
4. A decision not to grant the approval will only be taken by the Examination Committee after the student in question has been given an opportunity to be heard. The decision must be substantiated with arguments.
5. The decision shall state the degree program to which the flexible curriculum is deemed to belong.
6. The Examination Committee may deviate from the deadline set in paragraph 3 in special cases and must communicate this to the student.

Art 3.10 Exemption

1. Students are eligible for an exemption (VR), if the Examination Committee has determined that a study component does not need to be taken because of the stipulation in paragraph 4. This means the respective credits are allocated without a grade.
2. A written request for an exemption from an examination or a CA, or a practical exercise must be submitted to the Examination Committee.
3. The request must include all documents reasonably needed for an assessment of whether the students in question can be granted an exemption.

4. The grounds on which the Examination Committee can grant an exemption for taking a particular examination, CA or for a practical exercise are exclusively related to the level, the content and the quality of the examinations or CA the students in question have already passed, or to the students' knowledge, insight, skills or competencies acquired outside higher education.
5. An exemption cannot be granted for a Master's study component passed as part of the curriculum of a Bachelor's program. If this Master's study component is a compulsory component of a certain track within a Master's program, the Examination Committee should indicate an alternative component within the track, or to provide permission for a substitute study component chosen by the students.
6. In addition to the above, at the request of the students, study components successfully completed may be transferred to a different TU/e degree program retaining the grade and date of examination, if this refers to transfer students or intra-university transfer students within TU/e Master's programs.
7. The Examination Committee shall decide on the request for exemption within the response term.
8. A decision not to grant an exemption shall only be taken by the Examination Committee once the students have been given an opportunity to be heard. The decision must be substantiated with arguments.
9. The decision to grant an exemption for taking an examination or a practical exercise shall correspond to the grade 'sufficient' and be marked: VR (exemption). A decision to grant exemption from a CA corresponds with the assessment "sufficient competency development" and is indicated as 'EX'.
10. Conditions that apply to the granting of exemption are set out in the Regulations of the Examination Committee.

H 4 TESTING

Art 4.1 Frequency, structure and sequence of examinations and CA

1. Annually, before August 15, the Department Board will determine a timetable for written examinations and CAs in the first and second quarter, which will be published no later than August 15.
2. In special cases, the Department Board may deviate from the timetable referred to in the previous paragraph, yet no later than eight weeks before the written examinations or CA take place. The Department Board must inform the students of the change without delay, giving reasons.
3. Examinations to be administered orally or parts of a CA to be performed orally will be administered at a time determined by the examiner, wherever possible in consultation with the students in question.

4. There shall be at least two opportunities per study component in each academic year to take exams or CAs.
5. If a study component is removed from the curriculum, at least two more opportunities shall be given to take the examination in that study component during the first academic year in which the study component is no longer taught.
6. Notwithstanding the provisions of paragraph 4, at least one opportunity will be given in each academic year to take an examination for any study component not taught in that academic year. This does not apply to competency-centered programs.
7. In special cases, the Examination Committee may decide to deviate from the determined number of times an examination or CA may be taken, and from the form and the sequence in which that examination is taken.

Art 4.2 Oral examinations and oral parts of a CA

1. No more than one student shall be given an oral examination or CA component at a time.
2. When an oral examination or CA component is taken, two authorized teachers or an authorized teacher and a subject specialist shall be present.
3. Oral examinations or CAs shall be administered publicly.
4. In special cases, the Examination Committee may deviate from the provisions in the previous paragraphs of this article.

Art 4.3 Participation in and registration for exams

1. Students must be enrolled in a degree program in order to take the examinations or a CA offered by that program, taking into account the sequence specified in Appendix 1 under e, h and i.
2. The Examination Committee may grant permission to Bachelor's and pre-Master's students to take specific Master's components without being enrolled in that program, as long as the requirements have been met as stated in Article 5.2 of the Program and Examination Regulations of the Bachelor Program. The following paragraph shall apply mutatis mutandis to participation in the examination. See also Article 2.2 of these Program and Examination Regulations.
3. For both an exam as well as a CA, registration for the study component in question automatically results in registration for the exam or CA. In all other cases, students wishing to take part in a centrally organized written examination must register through OSIRIS, no later than ten (10) working days before the scheduled date of the relevant examination period. Students can register for examinations from August 15 preceding the start of the academic year for the first and second quarter and December 15 for the third and fourth quarter. The registration and closing dates shall be made known annually by ESA.
4. Students are obliged, before or during the examination or a CA, and at the request of the examiner or the invigilator, to identify themselves by showing their campus card.

5. Students who do not bring a campus card can also identify themselves using a valid means of identification. Students who are unable to do this, will not be permitted to take part in the examination or a CA.
6. Student who have already taken an examination three times, or a CA two times, without passing should consult academic advisor before registering for the examination in question again or before automatic enrollment in the case of the CA, to discuss how the problem is to be addressed on the basis of a study plan drawn up by the students.
7. For implementation of paragraph 6 of this article, students who register for an examination or a CA but fail to turn up, or who do not hand in the completed examination work/CA deliverables before the deadline, will be deemed to have failed the examination or a CA.
8. The work of students who take part in an examination or a CA without having registered for it will not be assessed. In such cases, the students shall be deemed not to have taken the examination or a CA.
9. If there are extenuating personal circumstances that prevented the students from registering for the examination or CA in time, the Examination Committee can decide that the examiner must assess the students' work after all.
10. The Examination Committee determines whether students fulfil the conditions for admission to the examination or a CA.
11. In exceptional circumstances, the Examination Committee can permit students to take an alternative examination to the centrally organized examination or a CA.

Art 4.4 Registering for exams after the registration period has passed

1. Students who fail to register for an exam within the period specified in Article 4.3 paragraph 3 shall not be allowed to participate in the exam, unless the students have paid administration costs totalling € 20 per study component no later than five working days before the examination period. After payment of the administration costs the students are immediately registered.
2. In cases of force majeure, at the discretion of the ESA Director, it may be decided that students who register after the terms mentioned in paragraph 1 may nevertheless be registered for an exam. In addition, the ESA Director may waive the administration costs stated in paragraph 1.
3. In the case that students cannot participate (after all) in a study component, due to force majeure, for which they have already paid administration costs, the fee will be refunded.

Art 4.5 Withdrawal

1. After registering for an examination, students can withdraw no later than five working days before the examination period, by notifying ESA through OSIRIS.
2. With reference to Article 4.3, paragraph 6, students who withdraw within five working days before the examination period shall be deemed to have failed this examination.

Art 4.6 Assessment of examinations and CA

1. The assessment of examinations and practical exercises and CAs is carried out by one or more examiners.
2. The results of examination, practical exercises and CA will be determined for individual students, and may be divided into a number of components.
 - a. The assessment of an examination, as well as the investigation mentioned in Article 5.1, paragraph 2, shall be expressed in whole numbers on a scale of 0 to 10 or with "exemption" (EX) or Not met requirements (NMR).
 - b. The assessment of practical exercises is expressed in tenths or using the designations Failed (FL), Sufficient (PA), Good (GO), Very Good (VG), Completed (GN), or No Show (NS).
 - c. The results of a CA are expressed in one of the following statements:
 - Hold (H): insufficient and not promoted.
 - Conditional Hold (C): insufficient and not promoted unless conditions for the promotion, as stated by the examiner are met.
 - Promotion (P): sufficient and promoted.
 - Promotion with excellence (E):, excellent performance and promoted with excellence.
 - d. If the exam is divided into a number of components, the subject description in the course catalogue shall describe those components and indicate how they count with respect to the final grade.
 - e. The assessment of the graduation project shall be rounded to the nearest half grade on a scale of 0 to 10. The graduation project is considered successfully completed if it is assessed with a final grade of 6 or more (an assessment with a grade of 5.5 or lower means not successfully completed). The assessment of professional skills that are completed during graduation are part of the assessment of the graduation project. The course catalogue indicates if and when interim evaluations of the Master's thesis take place.
 - f. Meeting the requirements of professional skills as well as having passed all study components belonging to a curriculum is a formal requirement for admission to assessment of the graduation project.
- 3a. Students pass an examination by scoring a 6 or higher on the examination or with a grade of VR (exemption).
- b. Students pass a practical exercise as a study component if the grade is 6 or higher, or with an assessment of PA, GO, VG or DN or, in the case of an exemption, EX.
- c. Student complete a CA successfully if the verdict is P-verdict, or respectively an E-verdict or an EX has been awarded.

4. If students register for an examination or a CA but fail to appear, fail to submit the a CA deliverables before the deadline, have not withdrawn in time and/or did not show up at the CA related activities, they will be deemed to have failed the examination or a CA under the provisions of paragraph 5 of Article 4.3, paragraph 7, and the examination result and CA outcomes will be marked as a "No Show" (NS). The final grade is then 'Not met requirements' (NMR).
5. If students have committed fraud, the examination result, in accordance with Article 4.3, paragraph 6, will be deemed "failed" (FL) and CA outcomes as not promoted (H).
6. The assessment standards are announced no later than immediately before the start of the examinations, CAs or the practical exercises as a study component. The weight of the individual questions will be announced immediately before the start of a written test or an examination. In exceptional cases, the examiner may decide to adjust the weight of the questions after the examination.
7. The method of assessment should enable students to ascertain how the results of the examinations, CAs or the practical exercises as a study component were determined.
8. The Examination Committee has the authority to declare an examination null and void for individual students or for all students who took the exam at that time in case of serious irregularities.

Art 4.7 Determining results/marking periods

1. The examiners shall determine the result of a written examination as soon as possible but no later than 15 working days after the examination has taken place such that the final grade is specified in OSIRIS.
2. The examiners shall determine the results of an oral examination no more than one day later and will communicate these immediately to the students. The examiners will determine the final CA verdict within five working days of the presentation and will communicate the verdict to the students.
3. In the case of examinations or CA taken in other than oral or written form, the Examination Committee shall determine beforehand how and within what period the students will receive a written statement giving the result.
4. The examiners will determine the result of a practical exercise that serves as a study component as soon as possible, but no later than fifteen working days after it has been submitted or, if a deadline has been agreed, fifteen working days after this deadline, and they will communicate the mark (or final mark) to the students.

If a term or date has been determined for the submission of a practical exercise and if the students have not submitted the practical exercise on time due to extenuating personal circumstances, the Examination Committee can, on the students' requests, decide to have the practical exercise assessed anyway.

5. If the examiners in question are unable to meet the requirements in the previous paragraphs due to special circumstances, they shall notify the Examination Committee, stating the reasons. The students involved will immediately be informed of the delay by the Examination Committee, and of the term within which the results will be made known.
6. Students shall be informed of the result of the examination or a CA by or on behalf of the Examination Committee, in written or electronic form.
7. When they receive their results or a CA outcome, students will be informed of their rights of inspection, as referred to in Article 4.8, the opportunity to evaluate the examination, as referred to in Article 4.9, and the opportunity to submit an objection to the Examination Appeals Board.
8. In the case of exceptional circumstances, the examiner may alter the grade of an examination previously determined within four weeks of its initial announcement both to the advantage or disadvantage of the students.

If the alteration to the final grade has consequences for the completion of the Master's program or for a certificate already issued, the examiner must consult the Examination Committee before taking a decision.

9. The examination or a CA will be dated in accordance with the date on which the written or oral examination is administered or the CA is completed. An examination in the form of a practical exercise shall be dated in accordance with the date on which the final report is submitted or the date of the presentation, or, if there is no report or final presentation, the day on which the practical exercise is completed.

Art 4.8 Right of inspection for written examinations

1. Students shall be given the opportunity, on request, to inspect their assessed work up to at least 20 working days after the announcement of the result of a written examination. At the students' request, a copy of the assessed work will be provided.
2. During the term mentioned in paragraph 1, any interested person may, on request, inspect the questions and assignments of a given examination, as well as the standards on which the assessment was based.
3. Within five working days after the request for inspection has been received, the examiner shall announce the venue and the time of the inspection referred to in paragraphs 1 and 2.
4. If students or interested persons can prove that they were prevented from appearing at the fixed place and time through no fault of their own, they shall be offered another opportunity, if possible within the term mentioned in paragraph 1 of this article.

Art 4.9 Evaluation

As soon as possible after the announcement of the result of an oral examination, or the CA outcomes, at the request of the students concerned or on the initiative of the examiner, an evaluation will take place between the examiner and the student. In such cases, the assessments given shall be substantiated. An examiner can organize a collective evaluation.

Art 4.10 Term of validity and retention periods

1. In principle, examination results and a CA outcome are valid for an unlimited period.
2. If an examination result or a CA outcome is older than six years and the examined knowledge or examined insight is demonstrably dated, or if examined skills are demonstrably dated, however, the Examination Committee may require that the students take a supplementary or alternative examination or a CA.
3. Written examinations must be retained for at least two years following determination of the grade, with the exception of homework assignments.
4. (Three-dimensional) projects must be retained for at least six weeks after the grade has been determined but, in any event, for the duration of any objection and appeal procedures.
5. Internship reports, graduation reports, portfolios CA deliverables and theses produced in completion of the Master's program must be retained for at least seven years.

H 5 FINAL EXAMINATIONS

Art 5.1 Final examinations

1. The Examination Committee determines the results of the exam and issues the certificate as referred to in Article 5.3 as soon as the students have met the requirements of the examination program. The Examination Committee invites the students for a meeting to issue the degree certificate unless, on the grounds of paragraph 5, the student has asked the Examination Committee to delay awarding the certificate. The result of the final examination shall be "passed" or "withdrawn and the results attained shall be retained". If students have taken an examination or a CA more than once, the Examination Committee shall take into account the highest grade obtained in determining the result of the final examination.
2. Assessment of the examination dossier is part of the final examination. The date of the final examination shall be the date on which the students carried out the final program activity (see Article 4.7, paragraph 9).

3. In order to pass the final examination, the students must obtain the 'sufficient' grade and/or Promotion- (P) or Promotion with excellence (E) for all components, in compliance with the exemptions granted and the compensation arrangement from Article 4.2 of the Regulations of the Examination Committee. The Examination Committee can determine, under conditions established by the Committee itself, that not every examination has to be passed in order for students to pass the final examination (see Article 4.3 of the Regulations of the Examination Committee).
4. A further condition for passing the examination and receiving the degree certificate is that the students were enrolled for the TU/e degree program in question at the time the examinations were taken.
5. Students who have passed the final examination, and are eligible for the award of a degree certificate, can ask the Examination Committee to delay awarding it. This request must be submitted no later than two weeks after the students have been informed of the final examination result. The request must specify when the students wish to receive the degree certificate. The Examination Committee shall in any event comply with the request if the following situations apply:
 - the students are planning to take an extra study component that will be included in the diploma transcript, and/or
 - the students want to try to graduate with the cum laude classification and want to re-take examinations for certain study components to this end

Art 5.2 Frequency of final examinations

There shall be monthly opportunities to take the examination with the exception of July. Competency-centered programs offer two opportunities per year to take the final examination. The dates of the Examination Committee sessions shall be announced by the Examination Committee before the beginning of the academic year.

Art 5.3 Certificate and transcript

1. The degree certificates for each program shall be awarded in public unless, in exceptional cases, the Examination Committee decides otherwise.
2. The degree certificate shall, in any event, contain the information specified in Article 7.11, paragraph 2, of the WHW, together with the qualifications specified in Article 5.4 of these regulations. If applicable, the degree certificate should also state that the students have met the competency requirements as referred to in Article 36 of the Secondary Education Act.
3. When the degree certificate is awarded, the student shall also receive a transcript. One degree certificate is awarded per student for each degree program.

4. The transcript shall contain the information specified in Article 7.11, paragraph 3, of the WHW, as well as the grades obtained for parts of the final examination and, if required, for other study components that are not part of the examination, if the students in question have passed the examinations for those study components before the Examination Committee determines the final examination result.
- If applicable the transcript shall state for which school subjects and for which level of secondary education the holder is authorized to teach (Article 33 and 36 of the Secondary Education Act).

Art 5.4 Special qualifications for the Master's program

1. The Examination Committee may award the classification "cum laude" to certificates of students who started their degree programs before September 1, 2019 under the following conditions:
- they achieve an mathematical average of 8.0 or higher for the assessments of study components that belong to the program of examinations, and
 - a grade of 9.0 or higher for the graduation project, and
 - none of the study components belonging to the degree program may have a grade lower than a 6.0.
2. The Examinations Committee may award the classification "with great appreciation" to certificates of students who started their degree programs before September 1, 2019 under the following conditions:
- the student achieves an average grade of 7.5 or higher for all the courses, and
 - the graduation project is graded with 8.0 or higher, and
 - none of the courses may have a grade lower than a 6.
3. The Examination Committee may award the classification "cum laude" to students who started their degree programs on or after September 1, 2019 under the following conditions:
- they achieve a weighted mathematical average (based on credits) that is a unrounded 8.0 or higher in relation to the study components takes by students that belong to the program of examinations, with exception of the graduation project,
 - they have a grade of 9.0 or higher for the graduation project, and
 - none of their study components belonging to the program of examinations has a final grade lower than a 6 and
 - they must finish the final examination within 32 months of the commencement of the degree program.
- The examination committee may deviate from this latter requirement in special cases. To assess the student's request, the Examination Committee can take into account the extenuating personal circumstances as referred to in Appendix 2, Article 5 of these regulations.
4. With regard to the calculation of the average grade, as referred to in the preceding paragraphs, the results of the course 'International Course' will not be included in the calculation.

H 6 STUDY COUNSELING AND STUDY PROGRESS

Art 6.1 Study counseling

- 1.** The Department Board shall provide counseling to students for several matters, including orientation on specializations and other options inside or outside the degree program, including appointing one or more academic advisors.
- 2.** The academic advisor will advise students, either on request or on the advisor's own initiative, on all the aspects of the degree program, and will ensure, partly based on the students' study progress and whenever necessary, adequate referral to the qualified bodies of TU/e, to ESA student advisors and/or student counsellors or TU/e confidential counselors.

Art 6.2 Monitoring study progress

- 1.** The Department Board will ensure that the examination results and CA outcomes of the individual students are registered and made known in good time in OSIRIS.
- 2.** Where appropriate, the Department Board will organize a discussion of the results between the students and their academic advisor of the degree program the students are taking.
- 3.** The academic advisor will inform students who fall behind in their studies of the opportunities to receive extra support or measures that may need to be taken to limit the delay as much as possible.

Art 6.3 Studying with a functional impairment

- 1.** Students wishing to request an adjustment to the way of teaching or examinations or CAs, or for special facilities because of a permanent or temporary functional impairment, should submit such a request to ESA in writing before they are scheduled to take part in the program or the exams or CAs. The request should be submitted twelve weeks in advance if possible, but in any event no later than five weeks in advance.
- 2.** The request should be accompanied by any documents reasonably required to assess the request. These should include at least a recent statement from a physician or psychologist or from a remedial educationalist registered with BIG (Individual Health Care Professions), NIP (Dutch professional association of psychologists) or NVO (Association of Educationalists in the Netherlands). If possible, the statement should provide an estimation of the extent and likely duration of the functional impairment.
- 3.** ESA will send students' requests accompanied by the recommendations of the student counselor to the Department Board in so far as the request relates to facilities. In the event that the request relates to granting adaptations to enable the students to take an examination or CAs, ESA will send the students' request and the related recommendations to the Examination Committee.

4. The decision regarding adaptations or the granting of facilities shall be taken by the Department Board or the Examination Committee, respectively, no later than twenty working days after the request has been received. The Department Board shall care for the quality and level of the teaching and examinations.
5. Any adaptations shall be attuned as much as possible to the individual's functional impairment. Facilities provided may consist of adjustments to the individual situation of the form or duration of the teaching and/or examinations, or CAs, or of the provision of practical aids.

H 7 TRANSITIONAL ARRANGEMENTS AND FINAL PROVISIONS

Art 7.1 Transitional arrangements

1. If these regulations, including the Annex, are amended, the Department Board shall, if necessary, make a transitional arrangement. The transitional arrangement shall be incorporated in the Appendix to these Regulations.
2. The transitional arrangement shall always include:
regulations regarding exemptions that may be obtained based on examinations already passed, and
the term of validity of the transitional arrangement.

Art 7.2 Amendments

1. Amendments made to these regulations shall not apply in the current academic year if they unduly harm the interests of students.
2. An amendment of these regulations may not backdate any decision already taken in regard to students.

Art. 7.3 Transitional arrangement programs

1. Regarding Article 5.4, paragraph 1;
For students who started their degree programs before September 1, 2019, the requirement that the graduation date must be within 32 months after the commencement of the degree program does not apply.

APPENDICES

Appendix 1 to Article 3.2, paragraph 1 of the Program and Examination Regulations for the Master's Degree Programs in Human-Technology Interaction (HTI), Innovation Sciences (IS), Innovation Management (IM) and Operations Management and Logistics (OML).

a. Content of the degree program and related final examination

The degree program contains the following courses with the corresponding course code and credits and is concluded with the Master of Science examination Human-Technology Interaction and Innovation Sciences (notice Annex Table 1A (HTI), 1B (IS)) and the Master of Science Innovation Management and Operations Management and Logistics (notice Annex Table 1C (IM), 1D (OML)).

Those who have passed the final examination are adjudged the degree of Master of Science. The adjudged degree is stated on the testimonial of the final examination, with reference to the field of study: Human-Technology Interaction, Innovation Sciences., Innovation Management or Operations Management & Logistics.

b. Content of the tracks

The degree programs Human-Technology Interaction and Innovation Sciences contain the following specializations with the corresponding courses, course code and credits: notice annex Table 1A (HTI), 1B (IS). The degree programs Innovation Management and Operations Management & Logistics contain the following specializations with the corresponding courses, course code and credits: notice annex Table 1C (IM), 1D (OML). A student follows one of these specializations.

c. Organization of practical exercises

The following study components include practical exercises in the sense of Article 1.1.

d. Study load of the degree program and of each of the study components it comprises

The minimum study load of the program is 120 credits. The study load of the study component is indicated under a or b, respectively.

e. Number and frequency of the examinations, CAs and practical exercises

The number and order of the examinations and practical exercises of the degree program are administered under (a) or (b), respectively.

f. Form of the degree program

The program is a full-time program.

g. Format of examinations/CA

The examinations of the (compulsory and selected set of elective) courses shall be administered in the form indicated under (a) or (b), respectively.

h. Conditions for admission to the examinations/CA

Students may only take part in the examinations listed under a or b when they have passed the corresponding examinations stated below.

HTI and IS:

1. Students may only take part in the examinations listed below after they have passed the corresponding examinations listed under (a) or (b), respectively:
 - the course OHM170 (HTI) respectively OEM110 (IS) cannot be taken until the course OHV50, if labelled as a premaster course or as a homologation course within the master program, has been passed;
 - the Master Thesis cannot be taken until a minimum of 80 credits from the examinations for the program courses mentioned under (a) or (b), respectively, have been passed.
2. In special cases, the Examinations Committee may derogate from the previous provisions.

OML and IM:

1. Students may only take part in the examinations listed below after they have passed the corresponding examinations listed under a or b, respectively: the Master Thesis cannot be taken until a minimum of 80 credits from the examinations for the degree program courses mentioned under a or b, respectively, have been passed; additionally, regarding the final examination of the OML Master's degree program, students should have demonstrated that they have acquired sufficient knowledge in accounting and finance (e.g. obtained either from the courses 1CK40 + one of the courses 1CK80/1CK90, or from the course 1CM22, or from a similar course on financial and operational decision making at another university).
2. In special cases, the Examinations Committee may derogate from the provisions in paragraph 1.

i. Participation in practical exercises or CAs

The examinations of the following study components may not be taken until the corresponding practical exercises have been successfully completed:

-None-

j. The study components from which students must choose for the elective part of their degree programs

HTI and IS:

To fulfil the optional parts of their degree programs, students at least need to choose courses with a total of (at least) 15 credits for 'technical domain courses' and 15 credits International Course for HTI resp. (at least) 10 credits for technical courses and 15 credits International Course for IS, with the approval of the Examinations Committee. Notice that students do not need approval of the mentor/thesis advisor for 15 credits in the free electives part of the degree program. Furthermore, it is possible to include a maximum of 15 credits of Bachelor's courses of sufficient level to be determined by the Examination Committee; these possibly include homologation courses. In that case, students should motivate their choice and show that it is necessary to take one or more BSc courses as prior knowledge for one or more MSc courses in their study program.

IM and OML:

To fulfil the optional parts of their degree programs, students need to choose from the following courses: notice Annex Table 1A, 1B. Notice that students do not need approval of the mentor/thesis advisor for 15 credits in the free electives part of the degree program. Furthermore, it is possible to include a maximum of 15 credits of Bachelor's courses of sufficient level to be determined by the Examination Committee; these possibly include homologation courses. In that case, students should motivate their choice and show that it is necessary to take one or more BSc course(s) as prior knowledge for one or more MSc course(s) in their study program.

k. The number of opportunities to join the program

Internal intake: Students who have completed a Bachelor's degree at TU/e may join the Master's program on the first day of the month following successful completion of the Bachelor's degree audit. The same applies to students who have completed a pre-Master's program that provides admission to the Master's program. Students of competency-centered Master's learning programs may only join on September 1 or February 1 (see Regulations for 'Registration, Study Choice Check, Enrollment and Termination of Enrollment').

Other intake: As of September 1, 2012, students may join the Master's program on at least two dates: September 1 and February 1, in which a two-year program is offered that is manageable. External transfer students and rematriculaters, namely those who have not completed a Bachelor's degree at TU/e or who have not been enrolled at this university for a continuous period, may enroll in the Master's program on September 1 and February 1 of each academic year, provided they meet the requirements (see Regulations for 'Registration, Study Choice Check, Enrollment and Termination of Enrollment').

l. Admission requirements for issuing proof of admission

The admission requirements for the Master's degree programs correspond to qualities relating to the knowledge, insight, skills or competencies that students have acquired when they have finished their Bachelor's degree program (the preceding Bachelor's program).

Admission of foreign students:

Command of the English language

- TOEFL (Test of English as a Foreign Language): a minimum score of 21 for each section, and an overall band score of at least 90 points
- IELTS (International English Language Testing System), academic version: a minimum score of 6.0 for each section, and an overall band score of at least 6.5
- A minimum score C for Cambridge CAE or CPE.

The level of education of the foreign institution in which the students' completed pre-university education must minimally be comparable to that in the Netherlands.

Level of knowledge or level of competency development: students must have acquired sufficient knowledge on the basis of the study components they have studied abroad or must have developed their competencies sufficiently. In order to be admitted to a Master's program, their knowledge level must be comparable to that of Dutch students. See the Regulations for Admission to Master's Programs at Eindhoven University of Technology for the way in which this is assessed.

m. Bachelor's degree certificates that provide direct access to the Master's program

The certificate of the Bachelor's final examinations from the institutions for higher education indicated below provides direct access to the Master's program HTI:

- Bachelor's Innovation Sciences 'old style' and Bachelor's Innovation Sciences, Major Psychology & Technology, at the TU/e
- Industrial Engineering for Healthcare at the TU/e

The certificate of the Bachelor's final examinations from the institutions for higher education indicated below provides direct access to the Master's program IS:

- Bachelor's Innovation Sciences 'old style' and Bachelor's Innovation Sciences, Major Sustainable Innovation, at the TU/e
- Bachelor Science Programme (UM); Technische Bestuurskunde (TUD); Business & Information Technology (Twente); Technische Bedrijfskunde (Twente); Natuurwetenschappen en Innovatiemanagement (UU); Science Business & Innovation (VU)

For other possibilities see <http://doorstroommatrix.nl/>.

The certificate of the Bachelor's final examinations from the institutions for higher education indicated below provides direct access to the Master's programs IM and OML:

- Industrial Engineering and Industrial Engineering for Healthcare at the TU/e
- Industrial Engineering at the University of Twente
- Industrial Engineering at the University of Groningen

For other possibilities see <http://doorstroommatrix.nl/>.

n. Transitional arrangements

-Not applicable-

o. The way in which education in the degree program is evaluated and the results are made available to the relevant official bodies

The degree program shall describe the process of quality care in the departmental quality care plan, as determined by the Program Committee on June 7, 2018.

Appendix 2 to Article 3.2, paragraph 2 of the Program and Examination Regulations for the Master's Degree Programs in Human-Technology Interaction (HTI), Innovation Sciences (IS), Innovation Management (IM) and Operations Management and Logistics (OML).

Rules concerning the pre-Master's program

PRE-MASTER'S PROGRAMS

Art 1 Enrollment and admission

1. The admission and registration for a pre-Master's program relating to a Master's program chosen by students are open to those in possession of Higher Vocational Education (hbo) degree certificate or a university Bachelor's degree certificate from a university as well as a maximum of a 30-credit deficiency to be able to follow the Master's program. If the certificate has not yet been actually awarded, the prospective students may still enroll in the pre-Master's program on condition that in due time before the start of the pre-Master's program the students are in the possession of a statement by the Examination Committee of the institution in question declaring that they have fulfilled the conditions for obtaining the university or hbo degree.
2. Students will be admitted to their chosen Master's programs only after they have successfully completed the study components of the pre-Master's program.
3. The registration period as included in the applicable Regulations for Registration, Academic Career Check, Enrollment, and Termination of Enrollment shall apply for re-registration in the pre-Master's program.

Art 2 Conditions for the pre-Master's program

1. A pre-Master's program is a maximum of 30 credits. The study components belonging to a pre-Master's program must be scheduled within maximally two semesters from the moment of enrollment.
2. For students who have a Higher Vocational Education (hbo) degree certificate of a degree program
 - listed in Appendix 3, the pre-Master's program encompasses a maximum of 30 credits
 - b. not listed in Appendix 3, the Departmental Admissions Committee shall determine if the deficiency is 30 credits.If this is the case, the Departmental Admissions Committee shall decide whether admission to and enrollment in the regular pre-Master's program is permitted.
3. If the deficiency of students with a university degree certificate is maximally 30 credits, the Departmental Admissions Committee determines the size and content of the applicable pre-Master's program no later than August 15. If there is a second registration period for the pre-Master's program as of February 1, the pre-Master's program must be determined before January 15.
4. There shall be at least two opportunities per study component in a period of two semesters to take final tests or CAs.
5. If students with prior education at university have a deficiency of a maximum of 15 credits, the departmental Admissions Committee determines whether the students must follow a pre-Master's program or that the subjects can be taken within the Master's program.

6. If students cannot complete the pre-Master's program within six months of the start of the program and therefore are placed at a demonstrable disadvantage, and have obtained a minimum of 15 credits at that time, the students may submit a request to expand the program with a maximum of 15 credits worth of Master's study components. The credits obtained for Master's study components during the pre-Master's program shall be recorded on the students' Master's transcript as exemptions

Art 3 Curriculum for pre-Master's students

1. A program of examinations is a set of study components that constitute students' degree program (in this case, the pre-Master's program). In competency-centered Master programs, the program of examinations is operationalized in the PDP of the students.
2. Before the start of the pre-Master's program, the departmental CSA shall give all pre-Master's students a program of examinations. In competency-centered programs study components are laid down in the PDP of the students.
3. The composition of the pre-Master's program for students of an adjoining Higher Vocational Education (hbo) program is included in Appendix 3.
4. Individual pre-Master's programs may be composed for pre-Master's students with a university background.

Art 4 Study progress requirement for pre-Master's students

1. All pre-Master's students must complete the pre-Master's program within the term set for the program (maximally two semesters). If students do not meet this requirement, they shall not be admitted to the same or another pre-Master's program that belongs to the same Bachelor's program for a period of three years. In special cases the Examination Committee may deviate from this.
2. The study progress requirement does not apply to students who have submitted a request to the ESA to withdraw before December 1 (if it is a pre-Master's program that can be completed in one semester) or before March 1 (if it is a pre-Master's program that can be completed in two semesters) and who have not re-registered for another pre-Master's program at TU/e.
Furthermore the academic progress requirement does not apply to students who have submitted a request to the ESA to withdraw who started February 1 and before May 1 (if it is a pre-Master's program that can be completed in one semester) and did not re-register for another pre-Master's program at TU/e or do not re-register as of September 1 (if it is a pre-Master's program that can be completed in two semesters).
3. Pre-Master's students shall receive a written pre-recommendation from the Examination Committee on their study progress at the mid-point of the determined term. This pre-recommendation serves as a warning in the event that the student is making insufficient study progress.

4. Within the determined term (maximally two semesters), students shall receive a binding written study progress decision from the Examination Committee relating to their continuation of the pre-Master's program. The study progress decision is:
 - a) positive if the pre-Master's students have passed the complete pre-Master's program within the determined term, and it is
 - b) negative if the pre-Master's students have failed to meet the provisions stated under a).Any credits obtained from Master's study components do not count in this regard. The pre-Master's students shall not be allowed to continue the pre-Master's program.
5. In the event of extenuating personal circumstances, as referred to in Article 5, the Examination Committee determines when the standard must be satisfied.
6. Students who still have to successfully complete one study component can make a single request for one additional opportunity to complete the study component from the Examination Committee during enrollment as pre-Master's students, preferably directly after not receiving a pass during the resit.
7. If students have not met the academic progress requirement, their enrollment is terminated at the beginning of the next month.

Art 5 Personal circumstances

1. When a study progress decision is issued, any acknowledged extenuating personal circumstances are taken into account.
2. Extenuating personal circumstances include the following:
 - a. illness, physical, sensory or other forms of functional impairment, or pregnancy;
 - b. exceptional family circumstances;
 - c. membership or presidency of the University Council, the Department Council, a program board or committee, or membership of the board of a foundation whose statutes allow for the operation of facilities or services intended for students, or a body that, in the opinion of the Executive Board, has equivalent status considering its tasks;
 - d. membership of the board of a student organization of a reasonable size and with full legal status, or of a comparable organization of reasonable size, where priority is given to promoting the general common interest and activities are genuinely performed to that end;
 - e. other personal circumstances than those described in a to d that would lead to unreasonable hardship if they were not taken into account.
3. The extenuating personal circumstances referred to in the previous paragraph will only be taken into account if they are reported to the academic advisor as soon as possible and no later than twenty working days after they arise, by or on behalf of the students. In the case of pregnancy, the students must give notification as soon as possible, once she knows she is pregnant, but preferably no later than three months before the due date.
4. Students who wish extenuating personal circumstances to be taken into account must submit documentary proof that these circumstances exist or existed. The documentary proof must be submitted to ESA.

5. The academic advisor shall report extenuating personal circumstances in writing as soon as possible to the relevant Examination Committee, if students have given permission for this.
6. The Examination Committee shall ask the Central Committee on Extenuating Personal Circumstances for advice on the extenuating personal circumstances submitted by students.
7. In its letter of intent to issue a negative study progress decision, the Examination Committee must specify, giving reasons, whether extenuating personal circumstances can be recognized and what consequences this has for the students concerned.

Art 6 Application of the Program and Examination Regulations for the Bachelor's program within the Bachelor College

1. These Program and Examination Regulations apply to Master's study components (with exception to pre-Master's study components) that are included in the program of examinations of pre-Master's students.
2. The pre-Master's program contains study components belonging to a Bachelor's program within the Bachelor College, as well as pre-Master's study components belonging to the Graduate school. The following articles from the Program and Examination Regulations of the Bachelor's Program shall apply mutatis mutandis for these study components:
 - Article 3.8 registration for and withdrawal from study components
 - Article 3.9 registration for study components after the appointed time limit for registration
 - Article 5.1(with the exception of paragraph 3) frequency, form and sequence of interim tests and final tests
 - Article 5.3 oral final tests and CA components
 - Article 5.4 participation in and registration for examinations
 - Article 5.5 resits
 - Article 5.6 withdrawal
 - Article 5.7 assessment if examinations and Cas
 - Article 5.8 determining results/marking periods
 - Article 5.9 right of inspection for written (final) tests
 - Article 5.10 evaluation
 - Article 5.11 term of validity and retention periods
 - Article 7.1 student counseling (general)
 - Article 7.2 academic advisor/monitoring study progress/study planning
 - Article 7.8 studying with a functional impairment

Appendix 3 to Article 3.2, paragraph 3 of the Program and Examination Regulations for the Master’s Degree Programs in Human-Technology Interaction (HTI), Innovation Sciences (IS), Innovation Management (IM) and Operations Management and Logistics (OML).

The (regular) pre-master programs as referred to it article 1, which the student has to follow consists of the following courses:

HTI					
Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	**	Mathematics Test	0		
Q1	**	StudyChoiceCheck Premaster	0		
Q1	SFC601	Test English	0	Written exam (100%)	1x in Q1
Q1	2WBB0	Calculus Variant 2	5	Written exam (70%) Start test (10%) Midterm exam (10%) Online tests (10%)	Written exam: 2x in Q1 and Q2 Start test: 2x in Q1
Q1	0HV10	Introduction Psychology & Technology	5	Written exam (50%) Midterm test (25%) Assignment (25%) Professional Skill Writing – 1	Written exam: 2x in Q1 and Q2
Q1	0HP00	Behavioral Research Methods I	5	Written exam (55%) 3 Assignments (each 15%)	Written exam: 2x in Q1 and Q2
Q2	0HV30	Social Psychology & Consumer Behaviour	5	Written exam (70%) 2 Assignments (each 15%) Professional Skill Handling Scientific Information – 1	Written exam: 2x in Q2 and Q3
Q2	0HV100	Human Factors		Written exam (60%) 2 Assignments (each 20%)	Written exam: 2x in Q2 and Q3
Q2	0HV50	Behavioral Research Methods II	5	Final exam on notebook (70%) Weekly quizzes (30%) Professional Skill Handling Scientific Information – 2	Final exam: 2x in Q2 and Q3

IS					
Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	**	Mathematics Test	0		
Q1	**	StudyChoiceCheck Premaster	0		
Q1	SFC601	Test English	0	Written exam (100%)	1x in Q1
Q1	2WBB0	Calculus Variant 2	5	Written exam (70%) Start test (10%) Midterm exam (10%) Online tests (10%)	Written exam: 2x in Q1 and Q2 Start test: 2x in Q1
Q1	0SV30	Economics of Innovation: Introduction	5	Written exam (70%) 4 Assignments (15%) Assignment (15%) Professional Skill Handling Scientific Information – 1	Written exam: 2x in Q1 and Q2
Q1	0HP00	Behavioral Research Methods I	5	Written exam (55%) 3 Assignments (each 15%)	Written exam: 2x in Q1 and Q2
Q2	0SV100	Economics of Innovation: Advanced	5	Written exam (50%) 2 Group Assignments (each 25%)	Written exam: 2x in Q2 and Q3
Q2	0PMP05	Schakel Eind Project IS	5	Assignments (100%)	1x in Q2
Q2	0HV50	Behavioral Research Methods II	5	Final exam on notebook (70%) Weekly quizzes (30%) Professional Skill Handling Scientific Information – 2	Final exam: 2x in Q2 and Q3

Model Master Program and Examination Regulations 2019-2020 according to the Graduate School

OML					
Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	**	Mathematics Test	0		
Q1	**	StudyChoiceCheck Premaster	0		
Q1	SFC601	Test English	0	Written exam (100%)	1x in Q1
Q1	2DL10	Premaster Calculus & Probability	5	Written exam (90%) Start test (10%)	Written exam: 2x in Q1 and Q2 Start test: 2x in Q1
Q1	1CV10	Fundamentals of Financial and Management Accounting	5	Written exam (100%) Professional Skill Handling Scientific Information – 2	Written exam: 2x in Q1 and Q2
Q1	1JV00	Fundamentals of Work & Organizational Psychology	5	Written exam (55%) 3 Assignments (each 15%)	Written exam: 2x in Q1 and Q2
Q2	2DL20	Statistics	5	Written exam (70%) Online tests (15%) Midterm test (15%)	Written exam: 2x in Q2 and Q3
Q2	2DD50	Mathematics 2	5	Written exam (70%) 2 Intermediate tests (each 15%)	Written exam: 2x in Q2 and Q3
Q2	1CK50	Production and Inventory Control	5	Written exam (67%) Assignment (33%)	Written exam: 2x in Q2 and Q3

IM					
Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	**	Mathematics Test	0		
Q1	**	StudyChoiceCheck Premaster	0		
Q1	SFC601	Test English	0	Written exam (100%)	1x in Q1
Q1	1JP00	Fundamentals of Work & Organizational Psychology	2.5	Written exam (100%)	Written exam: 2x in Q1 and Q2 Start test: 2x in Q1
Q1	2DL15	Calculus & Probability for premaster IM	2.5	Written exam (90%) Start test (10%)	Written exam: 2x in Q1 and Q2
Q1	1ZEUA0	New Product Marketing	5	Written exam (60%) Assignment (40%)	Written exam: 2x in Q1 and Q2
Q1	1BK40	Business Analytics & Decision Support	5	Written exam (50%) 2 Assignments (each 25%)	Written exam: 2x in Q1 and Q2
Q2	1ZV00	Methodology for IE Research	5	Written exam (60%) 2 Group Assignments (each 20%)	Written exam: 2x in Q2 and Q3
Q2	2DD80	Statistics for IE	5	Written exam (70%) Online tests (15%) Group Assignment (15%)	Written exam: 2x in Q2 and Q3
Q2	1JZK40	Designing business processes	5	Design Assignment 1 (20%) Design Assignment 2 (30%) Design Assignment 3 (50%)	Design Assignment 3: 1x in Q2 and Q3

HBO bachelor graduates from HBO institutions listed below, are directly eligible to follow the (regular) pre-master program, referred to in article 3.

HTI	IS	OML	IM
<ul style="list-style-type: none"> • Automotive • Bouwkunde • Civiele Techniek • Elektrotechniek • Mechatronica • Technische Informatica • Technische Natuurkunde • Werktuigbouwkunde 	<ul style="list-style-type: none"> • Chemische Technologie • Electrical and Electronic Engineering • Elektrotechniek • Technische Informatica • Technische Natuurkunde • Werktuigbouwkunde 	<ul style="list-style-type: none"> • Autotechniek • Aviation (HvA) • ICT & Business • Bouwkunde • Bouwtechnische Bedrijfskunde • Business Engineering (InHolland) • Business Logistics (HvA) • Chemische Technologie • Civiele Techniek • Elektrotechniek • Engineering, Design & Innovation (Commerciële Wtb) • Industriële Automatisering (HU) • (Hogere) Informatica (Computertechniek) • Koninklijk Instituut voor de Marine (*) • Logistiek & Technische Vervoerskunde • Luchtvaarttechnologie (Aviation) (InHolland) • Mechatronica (Avans) • Mediatechnologie (HU) • Scheepsbouwkunde • Technische Bedrijfskunde • Technische Natuurkunde • Werktuigbouwkunde 	<ul style="list-style-type: none"> • Advanced Business Creations • Autotechniek • Aviation (HvA) • ICT & Business • Bouwkunde • Bouwtechnische Bedrijfskunde • Business Engineering (InHolland) • Chemie • Chemische Technologie • Civiele Techniek • Elektrotechniek • Engineering, Design & Innovation (Commerciële Wtb) • Industrieel Product Ontwerpen • Industriële Automatisering (HU) • (Hogere) Informatica (Computertechniek) • Koninklijk Instituut voor de Marine (*) • Logistiek & Economie (NHTV) • Logistiek & Technische Vervoerskunde • Luchtvaarttechnologie (Aviation) (InHolland) • Mechatronica (Avans) • Mediatechnologie (HU) • Scheepsbouwkunde • Technische Bedrijfskunde • Technische Natuurkunde • Werktuigbouwkunde

Appendix 4 Explanatory notes to the Program and Examination Regulations for the 2019-2020 Master's program relating to pre-Master's programs

In connection with the inclusion of the rules concerning the pre-Master's program in Appendix 2 of this OER, additional information is provided below.

Art 1 Enrollment and admission

In order to participate, students must at least possess a Bachelor's degree or Master's degree from a university (or a statement from the Examination Committee that they meet the requirements to obtain a Higher Vocational Education (hbo) degree certificate or university degree before September 1 but that the degree certificate has not yet been issued) and has a maximum deficiency of 30 credits. Appendix 3 states the hbo programs that allow direct access to the pre-Master's program. Pre-Master's students must register through 'Studielink' before August 1 for the pre-Master's programs that they would like to follow. It is also possible to register no later than January 1 for a pre-Master's program that starts February 1 .

Art 2 Conditions for the pre-Master's program

Students with a degree certificate from a hbo program, as stated in Appendix 3, who request registration for a pre-Master's program are directly admissible. Before commencement of the program, the students must pay a fee for this. If the hbo program is not listed in Appendix 3, or the students have a prior university background, the Departmental Admissions Committee shall assess what the level of deficiency is of students. For a deficiency that exceeds 30 credits, the students shall not be admitted to a pre-Master's program and shall be advised to enroll in the preparatory Bachelor's program. For a deficiency with a maximum of 30 credits, the students must register for a regular pre-Master's program. For students with previous university training who have a deficiency of 15 credits or fewer, the departmental Admissions Committee determines whether they are directly admissible to the Master's program and must remedy the deficiencies within the Master's program. See paragraph 1 of this article.

The Departmental Admissions Committee shall establish the pre-Master's programs to be followed by students, based on the registration application and prior education of university Bachelor's or Master's students, as stated in paragraph 2 of this article. The Committee will do this after having given the students the opportunity to state the reasons that they consider themselves eligible for admission to the pre-Master's program and whether they would like to apply for exemptions based on competencies, knowledge, insight, or skills acquired elsewhere. Before commencement of the pre-Master's program, the students shall pay a fee. For regulations pertaining to this, please refer to the applicable Regulations for Registration, Academic Career Check, Enrollment, and Termination of Enrollment. This also applies to the Master's study components the students are allowed to take on the basis of paragraph 5.

Paragraph 3 states that at the request of students and with approval of the Examination Committee students may expand their pre-Master's programs with a maximum of 15 credits worth of Master's study components if the students

- cannot complete the pre-Master's program within six months of its commencement due to the scheduling of study components
- and 15 credits within the pre-Master's program have been completed

- and the Examination Committee has grounds to believe the students have sufficient prior knowledge to participate in Master's study components.

Students who have been granted permission to take additional study components will receive confirmation from the Examination Committee, which will also notify the ESA and the departmental CSA . The departmental CSA will add these study components to the program of examinations, as referred to in Article 3.

Art 3 Program of Examinations for pre-Master's students

Students may not take or be examined in study components that are not part of the program of examinations. The students can only register for those study components that are included in their program of examinations. They must therefore be careful to ensure that their program of examinations includes the study components that they would like to take and that they are allowed to take.

University students, as referred to in paragraph 4, are students with previous training that has been assessed by the Departmental Admissions Committee to be equivalent to three years of scientific education in the Netherlands.

Art 4 Study progress requirement for pre-Master's students

Since the introduction of the Bachelor-before-Master rule, pre-Master's students may no longer be admitted to a Master's program until they have completed the pre-Master's program. For this reason, a study progress requirement for pre-Master's students has become part of the regulations. These students must complete the pre-Master's program within the set term (maximally two semesters). Students who have been issued with a negative study progress decision may not re-register for the same TU/e program to which the pre-Master's program belongs for a period of three years.

At the mid-point of the pre-Master's program, the department may issue a provisional positive or negative recommendation, known as a pre-recommendation. If students receive a provisional negative pre-recommendation, this gives them a reasonable term in which to meet the study progress norm.

If students do not successfully complete the first year of the pre-Master's program, they shall receive a negative decision.

In the case of a postponed recommendation, the Examination Committee may establish an amended norm, in accordance with paragraph 5.

The Examination Committee may grant pre-Master's students one additional opportunity to take an exam , if the Examination Committee is of the opinion that the students will be able to complete the pre-Master's program by means of this extra opportunity to take an exam.

Art 5 Extenuating personal circumstances

Extenuating personal circumstances may play a role when issuing a study progress decision. These personal circumstances correspond to those that may play a role when issuing a binding recommendation on the continuation of studies. They are laid down in Article 2.1 of the 2008 WHW Implementation Decree. This article describes the procedure by which the students can put forward personal circumstances, if applicable. In order to assess those personal circumstances, the Examination Committee will seek

the advice of the Central Committee on Personal Circumstances. Based on this advice, the Examination Committee will decide whether a postponed binding recommendation, as referred to in Article 3.4, applies.

Art 6 Application of the Program and Examination Regulations for the Bachelor's program within the Bachelor College

Students who will be following a pre-Master's program will be registered in a Bachelor's program that prepares for a Master's program. The Program and Examination Regulations for this Bachelor's program shall thus also apply to the Bachelor's study components taken by the students.

**Annex Appendix 1 paragraph 1 to article 3.2, first paragraph, of the Program and Examination Regulations 2019-2020
for the Human-Technology Interaction and the Innovation Sciences Master's Degree Programs according to the Graduate School**

Table 1A

HTI Y1 Generation 2019

Courses degree program

Compulsory courses (55 ECTS)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examination can be taken
Q1/Q3	0HM100	Introduction to the HTI domain - Overview HTI	5	Term Paper/Essay (70%) Assignment (30%)	Paper: 1x in Q1 or 1x Q3
Q1	0HM110	User Experience Design (Design Track A)	5	Group Report (60%) Individual Report (20%) Theory Quiz (20%)	Final report: 2x (Q1 and Q2)
Q1	0HM120	Advanced Data Analysis	5	Assignments (100%)	2x (Q1 and Q2)
Q1-2/Q3-4	0HM170	HTI Research Project	10	Assignment incl. peer review (90%) Research Proposal Presentation (10%)	1x in Q2 or 1x in Q4
**	OPP06	Master Thesis	30	Final Report & Presentation (100%)	-

HTI Specialization Electives (≥ 25 Credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Restricted specialization electives: At least 5 out of 14 (of which at least 2 out of *)					
Q2	OHM130	Advanced Cognition*	5	Assignments Core Lectures and Discussion Points (30%) Final Exam (70%)	Written exam: 2x in Q2 and Q3
Q2	OHM140	Advanced Perception*	5	Bi- weekly assignments (50%) Final examination (50%)	Written exam: 2x in Q2 and Q3
Q2	OHM200	Psychology of Light and Time	5	Written Exam (70%) Two assignments (30%)	Written exam: 2x in Q2 and Q3
Q2	OHM220	Network Society	5	Assignments (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q2	OHM330	Sound Perception: Fundamentals and technical Applications	5	Written exam (70%) Assignment (30%)	Written exam: 2x in Q2 and Q3
Q3	OHM150	Advanced Cognitive Engineering*	5	Written exam (100 %)	Written exam: 2x in Q3 and Q4
Q3	OHM240	The Quantified Self in Health	5	Written exam (50%) Assignment 1: Research Proposal (15%) Assignment 2: Self-Tracking (20%) Assignment 3: Essay (15%)	Written exam: 2x in Q3 and Q4
Q3	OHM250	Online Behavior	5	Written report (60%) Presentation (20%) Active class participation (20%)	Written report: 1x in Q3
Q3	OHM260	Environmental Psychology	5	Written Exam (70%) Two assignments (30%)	Written exam: 2x in Q3 and Q4

Q4	0HM160	Advanced Social Psychology and Consumer Behavior*	5	Presentation (15%) Discussion points (30%) Written Exam (55%)	Written exam: 2x in Q4 and Interim
Q4	0HM270	Super Crunchers	5	Written exam (60%) Assignment(s) (40%)	Written exam: 2x in Q4 and Interim
Q4	0HM280	Human Robot Interaction	5	Written exam (50%) Group assignment including final presentation and demonstration (50%)	Written exam: 2x in Q4 and Interim
Q4	0HM320	Psychophysiology & Affective Computing	5	Written exam (55 %) Practical assignment 1 (15%) Practical assignment 2 (15%) Presentation on Affective Computing application (15%)	Written exam: 2x in Q4 and Interim

Free electives (≤ 40 credits), including International Experience (at least 15 Credits), engineering courses (at least 15 Credits of technology courses, resp. Built Environment, ICT, Robotics, Sustainable Energy) and (possible) homologation courses (≤ 15 Credits)

Table 1B

IS Y1 Generation 2019

Courses degree program

Compulsory courses (55 Credits)

Quarter (Y1)	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	0EM130	Modern Societies in Transition	5	Written paper (80%) Presentation (20%)	Written paper: 1x in Q3
Q1	0EM110	Research Methodology	5	Individual portfolio with assignments (100%)	1x in Q1
Q1	0EM120	Governing Innovations	5	Written exam (60%) Group assignment (30%) Individual assignment (10%)	Written exam: 2x in Q1 and Q2
Q3	0EM100	Evolutionary Foundations	5	Three sets of assignments (respectively counting for 30%, 30% and 40%)	1x in Q1
Q3	0EM150	Sustainability Transitions and Responsible Innovation	5	Written exam (60%) Group assignments (40%)	Written exam: 2x in Q3 and Q4
**	0EM06	Master Thesis	30	Report and presentation (100%)	-

Track 1 MSc IS: Global Sustainability

Compulsory specialization courses (≥ 20 credits)

Quarter (Y1)	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
A. Choose at least 2 out of 4:					
Q2	0EM140	Energy, Economy and Society	5	Assignments (45%) Written exam (55%)	Written exam: 2x in Q2 and Q3
Q2	0EM170	Global Connections	5	Assignment: Research proposal (40%) Paper (60%)	1x in Q2
Q3	0EM200	International Sustainable Development	5	Course paper (40%) Written exam (50%) (In-class participation (10%))	Written exam: 2x in Q3 and Q4
Q4	0EM310	From Industrial Ecology to Cradle-to-Cradle	5	individual oral examination (50%) Group report (50%)	Re-exam for both parts is possible: 2x in Q4 and Interim

Choose at least 2, in addition to * chosen in A:					
Q1	7LY3M0	Building Performance and Energy Systems Simulation	5	Report (100%)	2x in Q1
Q2	0EM140	Energy, Economy and Society*	5	Assignments (45%) Written exam (55%)	Written exam: 2x in Q2 and Q3
Q2	0EM170	Global Connections*	5	Assignment: Research proposal (40%) Paper (60%)	Assignment: 1x in Q2
Q2	7ZW5M0	Smart Urban Environments	5	Report (100%)	2x in Q2
Q2	4EM70	Sustainable Energy Sources	5	Written exam (100%)	2x in Q2 and Q3
Q3	0HM260	Environmental Psychology	5	Written Exam (70%) Two assignments (30%)	Written exam: 2x in Q3 and Q4
Q3	5LED0	Smart Grid Operation through ICT	5	Written exam (100%)	2x in Q3
Q3	0EM200	International Sustainable Development*	5	Course paper (40%) Written exam (50%) (In-class participation (10%))	Written exam: 2x in Q3 and Q4
Q4	0EM310	From Industrial Ecology to Cradle-to-Cradle*	5	Individual exam (50%) Individually group report (50%)	Written exam: 2x in Q4 and Interim
Q4	1CM170	Sustainable Supply Chains	5	Assignment (15%) Quizzes (25%) Final report (60%)	Report: 1x in Q4
Q4	7ZW4M0	Built Environment and Smart Mobility	5	Assignment (40%) Written exam (60%)	Written exam: 2x in Q4 and Interim

Track 2: Innovation Strategy and Policy

Compulsory specialization courses (≥ 20 credits)

Quarter (Y1)	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
A. Choose at least 2 out of 4:					
Q2	0HM220	Network Society	5	Assignments (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q2	0EM160	Innovation and Intellectual Property Rights	5	Written exam (60%) Group assignment (20%) Individual assignment (20%)	Written exam: 2x in Q2 and Q3
Q4	0EM190	Infonomics	5	Written exam (40%) Group assignment (40%) Individual assignment (20%)	Written exam: 2x in Q4 and Interim
Q4	0HM270	Supercrunchers	5	Written exam (60%) Assignment(s) (40%)	Written exam: 2x in Q4 and Interim
B. Choose at least 2, in addition to * chosen in A:					
Q1	1JM06	Human Aspects of Innovation	5	Written exam (40%) Group assignment(s) (60%)	Written exam: 2x in Q1 and Q2
Q2	0HM220	Network Society*	5	Assignments (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q2	0EM160	Innovation and Intellectual Property Rights*	5	Written exam (60%) Group assignment (20%) Individual assignment (20%)	Written exam: 2x in Q2 and Q3
Q2	1ZM20	Technology Entrepreneurship	5	The individual written exam (30%) Team assignment(s) (70%)	Written exam: 2x in Q2 and Q3
Q2	1ZM40	Strategy and Technology Management	5	Assignment (50%) Mid-term test(s) (50%)	Assignment: 1x in Q2
Q2	DCM130	Design for Social Innovation	5	Deliverables (100%)	2x in Q2 and Q3
Q3	1ZM11	Marketing and Innovation	5	Group assignment (30%) Written exam (70%)	Written exam : 2x in Q3 and Q4
Q4	0EM190	Infonomics*	5	Written exam (40%) Group assignment (40%) Individual assignment (20%)	Written exam: 2x in Q4 and Interim
Q4	0HM270	Supercrunchers*	5	Written exam (60% exam) Assignment(s) (40%)	Written exam: 2x in Q4 and Interim
Q4	1ZM90	Open Innovation	5	Assignment (40%) Written exam (60%)	Written exam : 2x in Q4 and Interim
Q4	5LTA0	Advanced Network Protocols***	5	Written exam (100%)	2x in Q4

Note: * This course is conditionally part of the compulsory specialization courses.**

Free electives (≤ 45 credits), including International Experience (at least 15 credits) engineering (technology) courses (at least 10 credits, esp. Built Environment, ICT, Sustainable Energy), and (possible) homologation courses (≤ 15 credits)

For more information per course: See course catalogue.

Annex Appendix 1 paragraph 1 to article 3.2, first paragraph, of the Program and Examination Regulations 2019-2020 for the Innovation Management and the Operations Management and Logistics Master's Degree Programs according to the Graduate School.

Table 1C

IM Y1 Generation 2019

Courses degree program

Common compulsory courses (65 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1JM06	Human Aspects of Innovation	5	Written exam (30%) Group assignment(s) (70%)	Written exam: 2x in Q1 and Q2
Q1	1ZM16	Management of Product Development	5	Individual examination (55%) Team assignment (45%).	Written exam: 2x in Q1 and Q2
Q1	1ZM31	Multivariate Statistics	5	Group assignments (50%) Written exam (50%)	Written exam: 2x in Q1 and Q2
Q3	1ZM11	Marketing & Innovation	5	Group assignment (30%) Written exam (70%)	Written exam: 2x in Q3 and Q4
Q3	1ZM65	System Dynamics	5	Case assignment (50%) Written examination MC using notebook (50%)	Written exam: 2x in Q3 and Q4
Q3	1BM110	Data analytics for Business Intelligence	5	Written examination (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 en Q4
Q4	1ZM130/ 1ZM140	Design Science Methodology and Projects	5/5	Final presentation (10%) Theoretical assignment in groups (30%) Design assignment in groups (60%)	Design assignment: 1x in Q4
**	1**96	Master Thesis	30	Master Thesis & Presentation (100 %)	-

IM Track 1: Business and Product Creation - 5 out of 9 (25 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q2	0EM160	Innovation and Intellectual Property Rights	5	Written exam (60%) Group assignment (20%) Individual assignment 20%	Written exam: 2x in Q2 and Q3
Q2	1JM100	Management of Organizational Change & Innovation	5	Multiple choice exam (40%) Group assignment (60%)	Multiple choice exam: 2x in Q2 and Q3
Q2	1ZM20	Technology Entrepreneurship	5	Individual written exam (30%) The (team) assignment(s) (70%)	Written exam: 2x in Q2 and Q3
Q2	0HM220	Network Society	5	Written exam (50%) Group work/ 2 assignments (50%)	Written exam: 2x in Q2 and Q3
Q2	1ZM120	Entrepreneurial Marketing	5	Group assignment (60%) Multiple choice exam (40%)	Multiple choice exam: 2x in Q2 and Q3
Q4	1BM20	Business Analysis for Information Technology systems	5	Final examination (50%) Group Assignment reports (50%)	Final exam: 2x in Q4 and Interim
Q4	1ZM60	Selling New Products	5	Group assignment (30%) Written individual exam (70%)	Written exam: 2x in Q4 and Interim
Q4	1ZM70	Entrepreneurial Finance	5	Group assignment(s) (30%) Written individual exam (70%)	Written exam: 2x in Q4 and Interim
Q4	1ZM90	Open Innovation	5	Assignment (40%) Written examination (60%)	Written exam: 2x in Q4 and Interim

IM Track 2: Managing Innovation Processes - 5 out of 9 (25 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q2	1BM05	Business Process Management	5	Written examination (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q2	1JM30	Managing team dynamics and team performance	5	Group report (70%) Individual report (15%) Class participation (15%)	Group report: 1x in Q1
Q2	1JM100	Management of Organizational Change & Innovation	5	Multiple choice exam (40%) Group assignment (60%)	MC exam: 2x in Q2 and Q3
Q2	1ZM40	Strategy & Technology Management	5	Written mid-term test (50%) Group assignment (50%)	1x in Q2
Q2	1ZM55	Service Engineering & Marketing	5	Group assignment (40%) Individual written examination (60%)	Written exam: 2x in Q2 and Q3
Q4	0EM190	Infonomics	5	Written exam (40%) Group assignment (40%) Individual assignment (20%)	Written exam: 2x in Q4 and Interim
Q4	1CM15	Project & Process Management	5	2 Homework exercises (100%)	1x in Q4
Q4	1ZM60	Selling New Products	5	Group assignment (30%) Written individual exam (70%)	Written exam: 2x in Q4 and Interim
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%) Written exam (60%)	Written exam: 2x in Q4 and Interim

(IM Track 3: Special / Free Track (30 credits): IE Honors programs in research and design; dual degree options. All specialization and free electives to be determined in close collaboration with the personal mentor and to be approved by the Research Director IE (in case of Honors program)/Program Managers (in case of dual degree))

Free electives, including International Experience (30 credits)

Table 1D

OML Y1 Generation 2019

Courses degree program

Common compulsory courses (45 credits) (with the exception of Track 6, OML-MSE)

Quarter	Course code	Course name	Credits	Number and times at which examinations can be taken	Examination: Types and weights
Q1	1JM11	Performance Enhancement	5	Written exam with multiple choice questions (40%) Group assignment/report (50%) Final presentation (10%)	Written exam: 1x in Q1
Q3	1JM110	Research Methods	5	Four group assignments (each 25%)	1x in Q3
**	1ML05	Preparation Master Thesis: Literature Study	5	Essay (100%)	-
**	1*M96	Master Thesis	30	Master Thesis & Presentation (100%)	-

OML Track 1: Data Intensive Industries

Compulsory specialization courses (= track core courses, 20 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q3	1BM110	Data Analytics for Business Intelligence	5	Written examination (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 en Q4
Q4	1BM130	Design of Data-Driven Business Operations	5	Presentation (20%) Final report (80%)	1x in Q4
Q4	1BM120	Computational Intelligence	5	Term assignment (70%) (group work) Final examination (30%)	Written exam: 2x in Q4 and Interim Possible to re-take the assignment
1 out of 2:					
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q4	1CM100	Multi Echelon Inventory Management	5	Group Assignment(s) (20%) Written final examination (80%)	Written exam: 2x in Q4 and Interim

Specialization electives (≥ 15 credits, at least 3 out of 18 - in addition to compulsory specialization courses)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	OLM120	Perspectives on Medical Technology	5	Weekly reading quizzes (10%) Case Study Essay (25%) Group presentation (15%) Final written exam (50%)	Written exam: 2x in Q1 and Q2
Q1	1ZM31	Multivariate Statistics	5	Group assignments (50%) Written exam (50%).	Written exam: 2x in Q1 and Q2
Q1	1CM150	Advanced Planning and Scheduling Systems	5	Assignments (60%) Final written exam (40%)	Written exam: 2x in Q1 and Q2
Q1	2IMI35	Introduction to process mining	5	Written exam: 100%	2x in Q1 and Q2
Q2	1BM05	Business Process Management	5	Written exam (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3

Q2	1JM100	Management of Organizational Change & Innovation	5	Multiple choice exam (40%) Group assignment (60%)	Multiple choice exam: 2x in Q2 and Q3
Q2	1JM30	Managing team dynamics and team performance	5	Group report (70%) Individual report (15%) (Class participation (15%))	Group report: 1x in Q1
Q2	2IMV20	Visualization	5	Written exam (100%)	2x in Q2 and Q3
Q2	1CM190	Healthcare Operations Planning	2.5	Participation (50%) 2 Assignments (each 25%)	1x in Q2
Q2	1CM200	Warehouse Operations Management	2.5	Written exam (70%) Report incl. presentation (30%)	Written exam: 2x in Q2 and Q3
Q3	1JM40	Behavioral Operations Management	5	Written exam (40%) 2 Assignments (each 30%)	Written exam: 2x in Q3 and Q4
Q3	1CM22	Integrated Financial & Operations Management	5	Written exam (100%)	2x in Q2 and Q3
Q3	1ZM65	System Dynamics	5	Case assignment (50%) Written examination MC using notebook (50%)	Written exam: 2x in Q3 and Q4
Q3	2DI66	Advanced Simulation	5	Assignments (100%)	1x in Q3
Q4	1BM20	Software Requirements Management: Quality & Functionality	5	Final written exam (50%) Group Assignment reports (50%)	Written exam: 2x in Q4 and Interim
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Final written examination (80%)	Written exam: 2x in Q4 and Interim
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%) Written exam (60%)	Written exam: 2 x in Q4 and Interim
Q4	2IMD15	Data Engineering	5	Written exam (100%)	2 x in Q4 and Interim

Free electives, including International Experience (40 credits)

OML Track 2: Capital Goods

Compulsory specialization courses (= track core courses, 20 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q4	1CM140	Design of Operations Planning & Control Systems	5	Assignments(s): First phase accounts for 40% Second phase accounts for 60%	1x in Q4
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Final written examination (80%)	Written exam: 2x in Q4 and Interim
1 out of 2:					
Q2	1BM05	Business Process Management	5	Written exam (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q3	1BM110	Data analytics for Business Intelligence	5	Written examination (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 and Q4

Specialization electives (≥ 15 credits, at least 3 out of 14 - in addition to compulsory specialization courses)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1CM150	Advanced Planning and Scheduling Systems	5	Assignments (60%) Final written exam (40%)	Written exam: 2x in Q1 and Q2
Q1	1ZM31	Multivariate Statistics	5	Group assignments (50%) Written exam (50%).	Written exam: 2x in Q1 and Q2
Q1	1CM120	Advanced Maintenance and Service Logistics	5	2 Homework Group Assignment(s) (30%) Final written examination (70%)	Written exam: 2x in Q1 and Q2
Q2	1BM05	Business process management	5	Written exam (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM200	Warehouse Operations Management	2.5	Written exam (70%) Report incl. presentation (30%)	Written exam: 2x in Q2 and Q3
Q2	1CM180	Configuration Management	2,5	Written exam (50%) 4 assignments (each 12.5%)	Written exam: 2x in Q3 and Q4
Q3	1JM40	Behavioral Operations Management	5	Written exam (40%) 2 Assignments (each 30%)	Written exam: 2x in Q3 and Q4
Q3	1BM110	Data Analytics for Business Intelligence	5	Written exam (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 and Q4
Q3	1CM22	Integrated Financial & Operations Management	5	Final written exam (100%)	2x in Q2 and Q3
Q3	1CM36	Game Theory with Applications to Supply Chain Management	5	Final written exam (100%)	2x in Q3 and Q4
Q3	2DI66	Advanced Simulation	5	Final written exam (100%)	2x in Q3 and Q4
Q4	1BM120	Computational Intelligence	5	Group Term Assignment (70%) Final examination (30%)	Written exam: 2x in Q4 and Interim Possible to re-take the assignment
Q4	1CM170	Sustainable Supply Chains	5	One assignment/peer review (15%) 7-8 Quizzes (25%) Final report (60%)	Report: 1x in Q4
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%) Written exam (60%)	Written exam: 2x in Q4 and Interim

Free electives, including International Experience (40 credits)

OML Track 3: Consumer Goods

Compulsory specialization courses (= track core courses, 20 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q2	1CM40	Retail Operations	5	Homework Group Assignments: <ul style="list-style-type: none"> - 40% in Q2 exam period - 20% in Q3 resit exam period Written exam: <ul style="list-style-type: none"> - 60% in Q2 exam period - 80% in Q3 resit exam period 	Written exam: 2x in Q2 and Q3
Q4	1CM140	Design of Operations Planning & Control Systems	5	Assignments(s): First phase accounts for 40% Second phase accounts for 60%	1x in Q4
1 out of 2:					
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q3	1BM110	Data Analytics for Business Intelligence	5	Written exam (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 and Q4
1 out of 2:					
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (30%) Final written exam (70%)	Written exam: 2x in Q4 and Interim

Specialization electives (≥ 15 credits, at least 3 out of 15 - in addition to compulsory specialization courses)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1ZM31	Multivariate Statistics	5	Group assignments (50%) Written exam (50%)	Written exam: 2x in Q1 and Q2
Q1	1CM150	Advanced Planning and Scheduling Systems	5	Assignments (60%) Final written exam (40%)	Written exam: 2x in Q1 and Q2
Q2	1BM05	Business Process Management	5	Written exam (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM110	Decision-making in Transport & Logistics	5	3 Assignments (each case counts for 33.33%)	1x in Q2
Q2	1CM200	Warehouse Operations Management	2.5	Written exam (70%) Report incl. presentation (30%)	Written exam: 2x in Q2 and Q3
Q3	1JM40	Behavioral Operations Management	5	Written exam (40%) 2 Assignments (each 30%)	Written exam: 2x in Q3 and Q4
Q3	1BM110	Data Analytics for Business Intelligence	5	Written examination (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 and Q4
Q3	1CM22	Integrated Financial & Operations Management	5	Final written exam 100%	2x in Q2 and Q3
Q3	1CM36	Game Theory with Applications to Supply Chain Management	5	Final written exam 100%	2x in Q3 and Q4
Q3	2DI66	Advanced Simulation	5	Final written exam (100%)	2x in Q3 and Q4
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (30%) Final written exam (70%)	Written exam: 2x in Q4 and Interim
Q4	1CM170	Sustainable Supply Chains	5	One assignment/peer review (15%) 7-8 Quizzes (25%) Final report (60%):	Report: 1x in Q4
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%). Written exam (60%)	Written exam: 2x in Q4 and Interim
Q4	1BM120	Computational Intelligence	5	Term assignment (70%) (group work) Final examination (30%)	Written exam: 2x in Q4 and Interim Possible to re-take the assignment

Free electives, including International Experience (40 credits)

OML Track 4: Service Operations

Compulsory specialization courses (= track core courses, 20 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q2	1BM05	Business Process Management	5	Written examination (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q4	1BM100	Design of Service Operations	5	Assignment (100%)	1x in Q4
1 out of 2:					
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q3	1BM110	Data Analytics for Business Intelligence	5	Written exam (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 and Q4
1 out of 2:					
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Final written exam (80%)	Written exam: 2x in Q4 and Interim

Specialization electives (≥ 15 credits, at least 3 out of 15 - in addition to compulsory specialization courses)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1BM10	Electronic Business	5	Group assignment 1 (70%) Group assignment 2 (30%)	1x in Q1
Q1	1ZM31	Multivariate Statistics	5	Group assignments (50%) Written exam (50%)	Written exam: 2x in Q1 and Q2
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q2	1JM100	Management of Organizational Change & Innovation	5	Multiple choice exam (40%) Group assignment (60%)	Multiple choice exam: 2x in Q2 and Q3
Q2	1JM30	Managing team dynamics and Team Performance	5	Group report (70%) Individual report (15%) Class participation (15%)	Group report: 1x in Q1
Q2	1CM190	Healthcare Operations Planning	2.5	Participation (50%) 2 Assignments (each 25%)	1x in Q2
Q3	1JM40	Behavioral Operations Management	5	Written exam (40%) 2 Assignments (each 30%)	Written exam: 2x in Q3 and Q4
Q3	1BM110	Data analytics for Business Intelligence	5	Written examination (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 and Q4
Q3	1CM22	Integrated Financial & Operations Management	5	Final written exam (100%)	2x in Q2 and Q3
Q3	1ZM65	System Dynamics	5	Case assignment (50%) Written examination MC using notebook (50%)	Written exam: 2x in Q3 and Q4
Q3	2DI66	Advanced Simulation	5	Assignments (100%)	1x in Q3
Q4	1BM120	Computational Intelligence	5	Group term assignment (70%) Final examination (30%)	Written exam: 2x in Q4 and Interim Possible to re-take the assignment
Q4	1BM20	Business Analysis for Information Technology Systems	5	Final written exam (50%) Group Assignment reports (50%)	Written exam: 2x in Q4 and Interim
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Final written exam (80%)	Written exam: 2x in Q4 and Interim
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%) Written exam (60%)	Written exam: 2x in Q4 and Interim

Free electives, including International Experience (40 credits)

OML Track 5: Transportation

Compulsory specialization courses (= track core courses, 20 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam ((50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM110	Decision-making in Transport & Logistics	5	3 Assignments (each 33.33%)	1x in Q2
Q4	1CM130	Design for Transport & Logistics	5	3 Assignments (each 33.33%)	1x in Q4
Q4	1CM75	Innovations in Global Freight Transport	5	Written exam (50%) Group assignment (50%)	Written exam: 2x in Q4 and Interim

Specialization electives (≥ 15 credits, at least 3 out of 12 - in addition to compulsory specialization courses)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1ZM31	Multivariate Statistics	5	Group assignments (50%) and written exam (50%).	2x in Q1 and Q2
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	2x in Q2 and Q3
Q3	1JM40	Behavioral Operations Management	5	Written exam (40%) 2 Assignments (each 30%)	Written exam: 2x in Q3 and Q4
Q3	1BM110	Data Analytics for Business Intelligence	5	Written Exam (70%) Group assignment (30%)	Written Exam: 2x in Q3 and Q4
Q3	1CM22	Integrated Financial & Operations Management	5	Final exam 100%	2x in Q2 and Q3
Q3	1CM36	Game Theory with Applications to Supply Chain Management	5	Final exam 100%	2x in Q3 and Q4
Q3	2DI66	Advanced simulation	5	Assignments (100%)	1x in Q3
Q4	1BM20	Business Analysis for Information Technology Systems	5	Written exam (50%) Group Assignment reports (50%)	Written exam: 2x in Q4 and Interim

Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Written exam (80%)	Written exam: 2x in Q4 and Interim
Q4	1BM120	Computational Intelligence	5	Group Term assignment (70%) Final examination (30%)	Written exam: 2x in Q4 and Interim Possible to re-take the assignment
Q4	1CM170	Sustainable supply chains	5	One assignment/peer review (15%) 7-8 Quizzes (25%) Final report (60%)	Report: 1x in Q4
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%) Written exam (60%)	Written exam: 2x in Q4 and Interim

Free electives, including International Experience (40 credits)

OML Track 6: Manufacturing Systems Engineering

Compulsory courses (75 credits)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1CM160	Manufacturing Technology	5	Seminar (15%) Group Assignment (15%) Written exam (70%)	Written exam: 2 x in Q3 and Q3
Q2	4CM70	Integrated System Design	5	Report (100%)	Report: 2 x in Q2 and Q3
1 out of 3: Machine Design & Control					
Q1	4CM00	Control Engineering	5	Oral examination (100%)	2x in Q1 and Q2
Q1	4UM00	Micro Fabrication	5	Oral examination (55%) Presentation (10%) Homework assignment 1 (5%) Homework assignment 2 (5%) Homework assignment 3 (5%) Final Report (15%) Planning report (5%)	Oral exam: 2x in Q1
Q3	4CM30	Supervisory Control	5	Assignment (50%) Written exam (50%)	Written exam: 2 x in Q3 and Q4
1 out of 2: Factory Design & Control					
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2 x in Q2 and Q3
Q4	4DM40	Modeling & Control of Manufacturing Networks	5	Oral examination (100%)	2x in Q4 and Interim
1 out of 2: Maintenance Design & Control					
Q1	1CM120	Advanced Maintenance & Service Logistics	5	2 Homework Group Assignment(s) (30%) Written exam (70%)	Written exam: 2x in Q1 and Q2
Q4	4MM50	Fracture Mechanics – Theory and Application	5	Written Exam (100%)	2x in Q4 and Interim
1 out of 2: Supply Network Design & Control					
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Written exam (80%)	Written exam: 2x in Q4 and Interim

Q4	1CM140	Design of Operations Planning & Control systems	5	Assignments(s): First phase accounts for 40% Second phase accounts for 60%	1x in Q4
**	1MSE45	Master Thesis	45	Final report and Presentation (100%)	-
**	1MSE15	International Internship	15	Report (100%)	-

Specialization electives (≥ 15 credits, at least 3 out of the courses listed below - in addition to compulsory specialization courses)

Quarter	Course code	Course name	Credits	Examination: Types and weights	Number and times at which examinations can be taken
Q1	1CM120	Advanced Maintenance & Service Logistics	5	2 Homework Group Assignment(s) (30%) Written exam (70%)	Written exam: 2x in Q1 and Q2
Q1	1BM10	Electronic Business	5	Two group assignments (counting for resp. 70% and 30%)	1x in Q1
Q1	4CM00	Control Engineering	5	Oral examination (100%)	2x in Q1 and Q2
Q1	4UM00	Micro Fabrication	5	Oral examination (55%) Presentation (10%) Homework assignment 1 (5%) Homework assignments 2 (5%) Homework assignments 3 (5%) Final Report (15%) Planning report (5%)	Oral exam: 2 x in Q1
Q2	1BM05	Business Process Management	5	Written examination (80%) Group assignment (20%)	Written exam: 2x in Q2 and Q3
Q2	1BM41	Business Information Systems Architecture (BISA)	5	Individual written exam (50%) Group-wise written report (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM10	Modeling & Analysis of Manufacturing Systems	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q2 and Q3
Q2	1CM40	Retail Operations	5	Homework Group Assignments: - 40% in Q2 exam period - 20% in Q3 resit exam period Written exam: - 60% in Q2 exam period - 80% in Q3 resit exam period	Written exam: 2x in Q2 and Q3
Q2	1CM110	Decision-making in Transport & Logistics	5	3 Assignments (each 33.33%)	1x in Q2
Q2	1JM100	Management of Organizational Change & Innovation	5	Multiple choice exam (40%) Group assignment (60%)	Multiple choice exam: 2x in Q2 and Q3
Q2	1CM180	Configuration Management	2,5	Written exam (50%) 4 assignments (each 12.5%)	Written exam: 2x in Q3 and Q4
Q3	1JM40	Behavioral Operations Management	5	Written exam (40%) 2 Assignments (each 30%)	Written exam: 2x in Q3 and Q4
Q3	1CM22	Integrated Financial & Operations Management	5	Written exam (100%)	2x in Q2 and Q3

Q3	1CM36	Game Theory with Applications to Supply Chain Management	5	Final written exam (100%)	2x in Q3 and Q4
Q3	1ZM65	System Dynamics	5	Case assignment (50%) Written examination MC using notebook (50%)	Written exam: 2x in Q3 and Q4
Q3	4CM30	Supervisory Control	5	Assignment (50%) Written exam (50%)	Written exam: 2x in Q3 and Q4
Q3	1BM110	Data analytics for Business Intelligence	5	Written examination (70%) Assignment (groups) (30%)	Written exam: 2x in Q3 en Q4
Q4	1BM120	Computational Intelligence	5	Term assignment (70%) (group work) Final examination (30%)	Written exam: 2x in Q4 and Interim Possible to re-take the assignment
Q4	1BM20	Software Requirements Management: Quality & Functionality	5	Final examination (50%) Group Assignment reports (50%)	Final exam: 2x in Q4 and Interim
Q4	1BM100	Design of Service Operations	5	Assignment (100%)	1 x in Q4
Q4	1CM170	Sustainable Supply Chains	5	One assignment/peer review (15%) 7-8 Quizzes (25%) Final report (60%)	Report: 1x in Q4
Q4	1CM75	Innovations in Global Freight Transport	5	Written exam (50%) Group assignment (50%)	Written exam: 2x in Q4 and Interim
Q4	1CM100	Multi-Echelon Inventory Management	5	Group Assignment(s) (20%) Written final examination (80%)	Written exam: 2x in Q4 and Interim
Q4	1CM130	Design for Transport & Logistics	5	3 Assignments (each 33.33%)	1x in Q4
Q4	1CM140	Design of Operations Planning & Control systems	5	Assignments(s): First phase accounts for 40% Second phase accounts for 60%	1x in Q4
Q4	1JM21	Designing Effective Performance Management Systems	5	Group assignment (40%) Written exam (60%)	Written exam: 2x in Q4 and Interim
Q4	4DM40	Modeling & Control of Manufacturing Networks	5	Oral examination (100%)	2x in Q4 and Interim
Q4	4MM50	Fracture Mechanics. Theory & application	5	Written examination using Notebook (100%)	2x in Q4 and Interim

Free electives (15 credits)