

TEACHING AND EXAMINATION REGULATIONS

MASTER'S DEGREE PROGRAMMES

A. FACULTY SECTION

B. PROGRAMME-SPECIFIC SECTION

Academic year 2016-2017

Introduction to the Teaching and Examination Regulations for Master's degree programmes of the Faculty of Electrical Engineering, Mathematics and Computer Science.

General

Since the introduction of the Dutch Higher Education and Research Act (*Wet op het hoger onderwijs en wetenschappelijk onderzoek*, WHW) in 1993, it has been compulsory for the broad outlines of the teaching programme and examining for each degree programme to be recorded in Teaching and Examination Regulations (OER).

In accordance with Section 7.13, paragraph 1, of the WHW, the OER must contain sufficient and clear information about the degree programme or group of programmes. Section 7.13, paragraph 2, of the WHW lists those issues that must, as a minimum, be regulated in the OER with respect to the procedures and rights and responsibilities relating to the teaching and examinations applicable for each degree programme or group of programmes. The WHW also includes a number of separate obligations relating to the inclusion of rules within the OER.

The model OER is subdivided into two sections (Section A and Section B), which together form the OER. Section A, which can be seen as the faculty section, includes provisions that may apply for several degree programmes. Section B contains the provisions that are specific to the particular degree programme.

SECTION A: FACULTY SECTION

1. General provisions

Article 1.1 Applicability of the Regulations

1. These Regulations apply to the teaching and examinations for the Master's degree programmes: Applied Mathematics, Business Information Technology, Computer Science, Electrical Engineering, Embedded Systems, Human Media Interaction, Internet Science and Technology (formerly Telematics).
1. (Hereinafter referred to as: the Master's programme) provided by the Faculty of Electrical Engineering, Mathematics and Computer Science (hereinafter referred to as: the faculty or EEMCS) of the University of Twente.
2. These Regulations consist of a faculty section (A) and a programme-specific section (B). Section A contains general provisions and applies to the teaching and examinations of the Master's programmes of EEMCS. Section B contains programme-specific provisions. Together, Sections A and B form the Teaching and Examination Regulations for the programme.
3. The Regulations can be declared to apply *mutatis mutandis* to the joint degree programmes and units of study, pursuant to Section 7.3c of the WHW, also provided by the faculty.
4. These Regulations apply to anyone enrolled in the programme, irrespective of the academic year in which the student was first enrolled in the programme.
5. Section B of these Teaching and Examination Regulations may contain additional general provisions for the relevant programme.
6. The general provisions and the programme-specific appendix of the Teaching and Examination Regulations are authorized by the dean.
7. The Examination Board set down the Examination Board Regulations for the execution of its tasks and powers in accordance with Section 7.12b of the WHW. These regulations are laid down in the Rules and Regulations of the Examination Board.

Article 1.2 Definitions

The following definitions are used in these Regulations:

- a. **EC:** European Credit. A unit of 28 hours of study load, in accordance with the European Credit Transfer System (ECTS), a full academic year consisting of 60 EC or 1680 hours (Article 7.4 WHW);
- b. **Final examination (examen):** A degree programme concludes with a final examination. A final examination is deemed successfully completed if the units of study belonging to a programme have been completed successfully. The examination may also include an additional assessment by the Examination Board;
- c. **Executive Board:** Executive Board of the University of Twente;
- a. **Dean:** Head of the faculty;
- b. **Fraud and plagiarism:** Fraud is an act or omission by a student designed to partly or wholly hinder the forming of a correct assessment of his own or someone else's knowledge, understanding and skills. Fraud also includes plagiarism, which is copying someone else's work without correct reference to the source;
- c. **Joint degree:** a degree awarded by an institution together with one or more institutions in the Netherlands or abroad, after the student has completed a degree programme (a degree programme, a major or a specific curriculum within a degree programme) for which the collaborating institutions are jointly responsible;

- d. **Double degree:** two degrees awarded by two higher education institutions offering a joint programme attesting the successful completion of this programme;
- e. **Course:** a unit of study of the programme within the meaning of the WHW;
- f. **Quarter or quartile:** a part of a semester as specified in the academic calendar (jaarcirkel) of the university;
- g. **Practical exercise:** the participation in a practical training or other educational learning activity, aimed at acquiring certain (academic) skills. Examples of practical exercises are:
 - researching and writing a thesis;
 - carrying out a research assignment;
 - taking part in fieldwork or an excursion;
 - taking part in another educational learning activity aimed at acquiring specific skills or participating in and completing a work placement.
- h. **Examination Board:** Sometimes referred to as Board of Examiners. The Examination Board is the body that establishes objectively and expertly whether a student meets the criteria set in the Education and Examination Regulations regarding knowledge, insight and skills needed for obtaining a degree;
- i. **Master's programme or programme:** the Master's degree programme as denoted in Article 7.3a paragraph 1 subparagraph b of the Act: the totality and cohesion of the course components, teaching activities/methods, contact hours, testing and examination methods and recommended literature;
- j. **Programme board:** The committee charged by the Dean with managing the programme;
- k. **Programme committee:** The Programme committee as referred to in article 10.3c WHW;
- l. **Master thesis project / final project:** a component comprising literature research and/or a contribution to scientific research, always resulting in a written report;
- m. **Student:** Anyone registered with a programme in accordance with Article 7.34 and 7.37 of the WHW;
- n. **Study adviser:** Person appointed by the Dean of the Faculty who acts as contact between the student and the programme, and in this role represents the interests of the students, as well as fulfilling an advisory role;
- o. **Disability:** all conditions which are (at least for the period in question) chronic or lasting in nature and which form a structural limitation for the student in receiving education, sitting (interim) examinations or taking part in practicals;
- p. **Student Information System (SIS):** The system designated by the institutional administration for the registration of and information relating to the relevant student and study data, as stipulated in the WHW, in this case Osiris;
- q. **Course catalogue:** the guide for the degree programme that provides further details of the provisions and other information specific to that programme. The course catalogue is available electronically at www.utwente.nl/coursecatalogue;
- r. **Study load:** the study load of the unit of study to which an interim examination applies, expressed in terms of EC (ECTS = European Credit and Transfer Accumulation System). (The study load for 1 year (1,680 hours) is 60 EC credits);
- s. **Academic year:** the period beginning on 1 September and ending on 31 August of the following calendar year;
- t. **Interim examination (tentamen)** an assessment of the student's knowledge, understanding and skills relating to a course component. The assessment is expressed in terms of a final mark. An interim examination may consist of one or more tests (*deeltentamens*);
- u. **Test:** part of an interim examination (*deeltentamen*);

- v. **Examiner:** The individual who has been appointed by the Examination Board in accordance with Article 7.12c of the WHW to hold examinations and tests and determine their results;
- w. **Admission Board** the committee that assesses, on behalf of the dean, whether a candidate meets the requirements for admission to the Master's degree programme of his/her choice. If there is no Admissions Board appointed for the degree programme, the programme board functions as Admissions Board;
- x. **Bridging programme or premaster:** a programme that can be offered to students with limited deficiencies and who are not yet admissible to the master programme according to Article 7.30 of the Act;
- y. **Homologation:** a programme that can be offered to students with limited deficiencies and who are already admissible to the master programme according to Article 7.30 of the Act;
- z. **University:** the University of Twente (UT);
- aa. **WHW:** the Dutch Higher Education and Research Act (*Wet op het hoger onderwijs en wetenschappelijk onderzoek*, WHW);

The other terms have the meanings ascribed to them by the WHW.

2. Previous education and admission

Article 2.1 Previous education

1. In order to qualify for enrolment in a Master's programme, a Bachelor's degree obtained in academic higher education (WO) or a bachelor degree from a university of applied sciences (HBO) complemented with an appropriate pre master programme is required. The requirements that the Bachelor's degree must meet are specified in Section B.
2. In the event that a candidate does not have a Bachelor's degree as referred to in paragraph 1, the Admissions Board of the degree programme will assess suitability for admission to the programme on the basis of the requirements stipulated in Section B.

Article 2.2 Registration and enrolment

1. The deadline for application for admission for the Master's programme is stipulated on the website www.utwente.nl/master. Different application deadlines apply to different types of applicants.
2. After registering on time, the student must enroll before 1 September or before 1 February.

Article 2.3 Admissions Board

Each programme has an Admissions Board established by the dean. The dean will appoint its members after consultation with the programme directors and Examination Boards of the relevant degree programmes.

Article 2.4 Admissions procedure

1. The Admissions Board is responsible for admission to the programme.
2. With a view to admission to the programme, the Admissions Board assesses the candidate's knowledge, understanding and skills. The Board may request experts within or outside the University to test certain types of knowledge, understanding and skills, in order to supplement written evidence of the programme/programmes the student has already completed. In its assessment, the Board includes knowledge of the language in which the programme will be taught.

3. Candidates receive either confirmation of admission to the master's programme, admission to a pre-master's programme or a negative decision. An appeal against a decision can be lodged with the *UT Klachtenloket* (or UT Complaints Desk) within six weeks.

Article 2.5 Refusal or termination of enrolment (unsuitability/judicium abeundi)

1. Based on the provisions of Section 7.42a of the WHW, the dean or the Examination Board may, in exceptional cases, ask the Executive Board to terminate or refuse a student's enrolment in a programme, if that student's actions or remarks show that he/she is unsuitable either for practicing one or more of the professions for which the programme in question is preparing the student or for the practical preparation for professional practice.
2. If a student is suspected of being unsuitable as described in paragraph 1, the Examination Board or the dean will institute an inquiry, of which the student will be informed immediately. The Examination Board or the dean will not issue any recommendation without carefully considering the interests involved and giving the student the opportunity to be heard.

Article 2.6 Admission requirements

1. Students with a Bachelor's degree in a field that corresponds to a sufficient extent with the subject area covered by the Master's programme can request admission to the programme.
2. The Admissions Board will investigate whether the interested person meets the admission requirements.
3. The Admissions Board can admit students that lack some prior knowledge, if it is estimated that the student's chances to finish the programme successfully will not be hampered by this.
4. The Admissions Board can determine that units they shall stipulate must be included in the master's study to compensate for lacking knowledge of the student (homologation courses).
5. In addition to the requirement referred to in the before mentioned sections, the Board will also assess requests for admission in terms of the following documents:
 - a. Motivation letter;
 - b. English proficiency test (art 2.8)
 - c. Diploma
 - d. Transcript of records
 - e. Curriculum vitae
 - f. Two references
 - g. Abstract of thesis
 - h. Course descriptions for programme-specific courses, research methodology courses, math courses and a table of content for the course materials.
6. The Bachelor's programme from which students are automatically admissible are mentioned in the programme-specific section B.
7. If the intended Master's programme includes different specializations, admission requirements may differ per specialization for applicants who are not directly admissible.
8. When the programme commences, the candidate must have a fully completed the Bachelor's programme allowing admission to this Master's programme.
9. Additional admission requirements are stipulated in Section B.

Article 2.7 Pre-Master's programme

1. A pre-Master's programme is a bridging programme containing a study load of 15 or 30 EC.
2. The pre-Master's is assembled by the programme director together with the Admissions Board.

3. The Admissions Board can decide to admit a candidate to the Master's programme on the condition that before the final admission a bridging programme is completed successfully.
4. Proof of a successfully completed pre-Master's programme, together with the related bachelor's programme degree serves as proof of admission to the Master's programme specified within it, in the same and the subsequent academic year.
5. From the start, candidates shall complete the pre-Master's programme within an academic year unless otherwise specified. For the interim examination of each part of the programme two occasions are given.

Article 2.8 English language requirement for English-language Master's programmes

1. The proficiency requirement in English as the language of instruction can be met by the successful completion of one of the following examinations or an equivalent:
 - IELTS: 6.5
 - TOEFL internet based test: 90
 - Cambridge CAE-C (CPE)
2. Exemption is granted from the examination in English referred to in the first paragraph to students who:
 - are native speakers of the countries specified on the relevant page on the web site of the UT, see www.utwente.nl/en/education/master/admission-requirements/international-degree/;
 - have obtained a relevant bachelor's degree from an accredited academic institution in the Netherlands;
 - have obtained a three-year bachelor's degree in one of the following countries: Australia, Canada, Ireland, New Zealand, the United Kingdom or the United States of America

3. Degree programme structure

Article 3.1 Structure of academic year

1. Every degree programme will be offered in two years, each of which divided into two semesters.
2. Every semester consists of two consecutive periods of ten weeks.
3. The programmes will be taught in full-time.
4. The language of instruction is English.

Article 3.2 Programme structure

1. The programme comprises the units of study included in Section B.
2. The size of the degree programme in EC is 120. These 120 credits must not include any credits which constituted part of a previously passed Bachelor's audit.
3. If students must sign up for participation in a unit of study, this will only be possible in the periods designated for that purpose.

Article 3.3 Master's final Project

1. Requirements to starting the Final project:
 - a. Outside of the Final project a maximum of 10 EC for unfinished courses is allowed
 - b. In case the programme allows a combined final project and internship, 10 EC unfinished courses outside the internship and final project are allowed.
2. The student and the (day-to-day) supervisor must make an appointment about the starting and finishing dates of the Master's project.

3. This will be documented in a plan that takes into account the nominal length of the final project, a reasonable holiday period and uncompleted study units.
4. The planning must be approved by the supervisor and signed by the student.
5. Programme-specific regulations regarding the Final Project are stipulated in the programme-specific section B.

Artikel 3.4 Internship

1. The internship is a period of study related work for the amount of 20 credits that is carried out by the student at a company, university or institute outside the University of Twente.
2. Requirements for starting the internship:
 - a. At least 45 EC should be obtained before starting the internship.
 - b. For each programme additional requirements can apply. If so, these will be stipulated in section B.
3. A description of internship must have been drawn up in accordance with and be approved by a member of the staff who has a permanent position at the University of Twente. The approval must be given before the start of the internship.
4. The student has to register with the Internship Office EEMCS at least three months before starting his internship.
5. The daily supervisor of the internship is a staff member appointed by the institute where the placement is being done. This person should be mentioned in the project description, mentioned in paragraph 2.
6. The staff member, mentioned in paragraph 3, supervises the student from a distance during the internship. If adequate supervision is not - or no longer - possible, in the opinion of this supervisor, the latter can decide to take over the daily supervisor.
7. During the internship the student should write a report about his work. At the end of the internship period the report should be handed over to the daily supervisor. The daily supervisor gives an assessment by filling in the assessment form, handed over by the student. The assessment will be based on the supervisor's observations of the student and on the report.
8. The UT supervisor shall act as examiner for this unit, and will base his mark on the assessment by the company supervisor, the report by the student and a discussion with the student. The student should hand in the report to the UT supervisor within two months after the end of the internship.

Article 3.5 Confidentiality

1. The final report and internship report are public unless confidentiality conditions have been imposed as follows.
2. The programme management can declare a (final) report confidential for a limited period upon receiving a motivated request:
 - a. A request regarding confidentiality should be done by the first supervisor before the start of the final project or internship.
 - b. The confidential report is accessible for the supervisor, the programme management, and members of bodies that have the authority to assess the quality of the grading of the entire programme
 - c. All parties mentioned in 2b are obliged to respect the confidentiality of the report.
3. In case confidentiality conditions are imposed according to 2, the final presentation may be adapted in a way to avoid making the issues that are considered confidential public

Article 3.6 Flexible Degree programme

1. The Examination Board of the programme decides whether a student may take part in a flexible degree programme as stipulated in Section 7.3d of the WHW. The Examination Board assesses whether the programme is appropriate and consistent within the domain of the programme and whether the level is high enough in the light of the final attainment targets of the programme.
2. The flexible degree programme is put together and motivated by the student and must at least have the size, breadth and depth of a regular Master's programme.
3. The following conditions must at least have been met in order to be eligible for the Master's degree:
 - a. A deviation from the regular Master's programme of at least 30 EC with a coherent content
 - b. the level of the programme must match the objectives and exit qualifications that apply for the programme for which the student is enrolled

Article 3.7 Double / combined programme

In some cases, a student can obtain diplomas for two Master's programmes on the basis of a combined course programme satisfying the requirements of each individual programme.

The following conditions for the composition of a combined programme are formulated.

1. The student's course programme can be described as the amalgamation of two (not necessarily) disjunctive course programmes satisfying the requirements of both programmes.
2. The two sub-course programmes referred to in 1. Have no more than 30 credits from courses in common outside of a possible combined final project. In case of a combined final project and combined internship of 20 EC, both programmes may not have more than 20 EC from course in common. This not only includes units of study included in both course programmes, but also courses for which an exemption was granted for one course programme on the basis of a result earned as part of the other course programme.
3. If a single final project is included in the intersection of both course programmes as referred to in 1, the study load of the assignment should be at least 100% of the requirement in EC for the final project of the course programme of the student plus at least 50% of the requirement in EC for the graduation project of the other course programme.
4. In individual cases the programme director may determine that not all conditions have to be met.
5. Approval for the combined course programme is needed from both Examination boards.

Passing the final assessment for a combined programme

Students who based in a course programme as described above sit a combined final assessment will successfully pass if the assessments included in the file would result in passing the final assessment of both programmes individually in accordance with the applicable regulations. The Examination Boards of the programmes involved must decide to allow a student to pass the final assessment. The programme management gives instructions on the date of a combined final colloquium.

4. Examinations

Article 4.1 Signing up for courses and examinations

1. Every student must sign up in SIS for participation in a course. It is also mandatory to register beforehand for every interim examination opportunity.
2. By way of exception to the provisions of paragraph 1, any student who has correctly signed up for participation in the instruction/classes for a particular course and has been admitted

will also be signed up for the subsequent interim examination, unless the degree programme stipulates a different approach.

3. The student has the right to inspect recent model test questions or model tests, or old tests and their keys, along with the norm for assessment.
4. The assessment schedule must be published in Blackboard at least two weeks prior to the start of the study unit.
5. The assessment schedule must include:
 - a. The learning objectives;
 - b. When and how tests will be administered;
 - c. the relative weighting of the tests;
 - d. any required minimum grade per test
 - e. the resit for each test (if applicable), the form of the resit, when it will take place, and any conditions for participating in the resit;

Article 4.2 Type of examination

1. In the course catalogue the way is stipulated in which a unit of study is concluded and the form any examination will take.

At the student's request, the Examination Board may permit a different form of examination than that stipulated in the course catalogue.

The examiner can request the Examination Board to permit a different form of examination on the condition that all participants agree.

2. In the case of a unit of study that is no longer offered, in the academic year following its termination, at least one opportunity will be provided to sit the interim examination(s) or parts thereof and a transitional arrangement will be included in the programme-specific section for the subsequent period.

Article 4.3 Oral examinations

1. The examiner may conduct oral examinations involving more than one student at a time, unless one of the students involved objects to this.
2. Oral tests will be conducted in public, unless the Examination Board has determined otherwise in a particular case, possibly at the request of the examiner or the student.
3. If a third party wishes to be present during an oral test must submit this request to the Examination Board at least ten working days prior to the oral test. This does not apply for graduation colloquia.
4. If the Examination Board has determined that members of the Examination Board (or an observer representing the Examination Board) are to be present during the oral test, it will notify the examiner and the student at least one working day prior to the test.
5. For an oral test, there must be proof that the student was treated properly and that the assessment is reliable. This can be shown by, e.g., the presence of a second expert or a video recording of the sitting of the oral test. The assessment is documented by means a form that shows that the intended learning outcomes are met.

Article 4.4 Determining and announcing results

1. The result of a written exam or practical exercise is published via the SIS within 20 working days. The publication will be done by BOZ (Office of Educational Affairs).

- a. The examiner will determine the result of a written exam within 15 working days after the exam and notify BOZ of the result.
 - b. No rights can be derived from exam results that have been published via Blackboard or any other medium not being the SIS.
2. The result of an oral exam is made known to the student within one working day in the form of an authorized proof of result provided by the examiner.
3. If the result for a unit of study is based on the completion of one or more assignments, or on writing a paper or thesis, then the date of submission of the final assignment, paper or thesis will count as the exam date.
4. Should the examiner not be able to meet the term as described in paragraphs 1 and 2 due to extraordinary circumstances, he/she reports this with reasons to the Examination Board. The student is informed of the delay as soon as possible by the Examination Board, whereby the new term within which the result will be made known is also communicated. If the Examination Board is of the opinion that the examiner has not met his/her obligations, it may appoint another examiner to ascertain the result of the exam.
5. If a second exam is planned shortly after the first, the results of the first exam will be published at least ten working days prior to the second exam.

Article 4.5 Examination opportunities

1. There will be an opportunity at least twice a year to sit written or oral exams. Practical exercises can be completed at least once per year.

Article 4.6 Examination results

1. Marks are given on a scale from 1 to 10, with no decimal after the point.
2. EC will only be awarded for the unit of study if an interim examination has been completed with a grade of 6 or higher. No EC's will be awarded for components of units of study and/or individual tests.
3. If a student receives more than one authorized result for one and the same unit of study, the highest result will apply.

Article 4.7 Exemption

1. At the written request of the student, the Examination Board may exempt the student from taking one or more examination components, if the student:
 - a. has passed a course component of a university or higher professional education programme that is equivalent in both content and level; or
 - b. has demonstrated through his/her work and/or professional experience that he/she has sufficient knowledge and skills with regard to the relevant course component.
 - c. Students may be exempted from the obligation to participate in practical exercises if they can demonstrate that they expect to be placed in a moral dilemma as a result of the need to meet one of the requirements for this component. In such cases, the Examination Board decides whether the component can be carried out in another manner to be determined by the Board.
2. Exemptions may be granted with a maximum of 30 credits. The Examination Board can grant an exception in extraordinary cases.
3. Exemptions cannot be granted on the basis of results from a Bachelor's programme, the course in question should be substituted by another course.

Article 4.8 Validity period for results

1. The period of validity for an exam result that has been successfully completed is six years. .
2. Test results are only valid in the academic year in which they were obtained.
3. The Examination Board can extend this period in individual cases at the request of the student.

Article 4.9 Post-examination discussion and right of inspection

1. The student is entitled to a justification of the results of a test from the examiner, whereby the examiner substantiates the assessment that was given. If no collective discussion of the results is held, the student may submit a request for an individual discussion of the results to the examiner within ten working days of publication of the test results. The discussion must take place at the latest five weeks after the publication of the test results, in the presence of the examiner or an authorized replacement.
2. The student has the right to inspect his or her work for a period of two years after the assessment.

Article 4.10 Retention of examination results

1. The questions, elaborations and the assessed work of written tests will be retained for a period of two years.
2. The retention period of final assignments of the programme is seven years.

Article 4.11 Master's final examination

1. The Examination Board determines the result of the Master's final examination after it has established that the student has passed all the units of study belonging to the programme. The date recorded on the diploma, i.e. the examination date, is the date on which the student successfully completed the last remaining unit of study.
2. A diploma can only be awarded after the student has received formal approval for his study programme as described in the programme-specific section B.
3. If so desired, the student has the right to submit a substantiated request in writing to the Examination Board to postpone declaring the examination as 'successfully completed' and consequently postpone the presentation of the certificate as well. The student must indicate at least the duration of the postponement he desires in his request
4. If the student has requested postponement on the basis of paragraph 3, the examination date will be the date following postponement on which the Examination Board has decided to declare the student to have successfully completed the final examination.

Article 4.12 Diploma and transcript

1. The Examination Board grants a diploma as proof that the student has passed his/her final examination. The Executive Board sets the model for the diploma. The Examination Board adds a diploma supplement to the diploma providing information on the nature and content of the degree programme completed. The diploma supplement is drawn up in Dutch or English and complies with the European format.
2. The International Diploma Supplement will be appended to the certificate for the successfully completed final examination (WHW, Article 7.11, paragraph 4).
3. Individuals who have successfully completed more than one component of the programme and who cannot be awarded a diploma as stipulated in paragraph 1 will, on request, receive a

statement to be issued by the relevant Examination Board stating at least the components that have been successfully completed together with the units of study they involved, the number of EC obtained and the way in which the interim examinations were taken.

Article 4.13 Cum Laude

1. The Examination Board checks whether the student has fulfilled all requirements. If the *judicium Cum Laude* applies, then this will be mentioned on the diploma and its supplement.
2. In exceptional cases the Examination Board may positively deviate from the requirements to obtain *Cum Laude*.
3. The *judicium Cum Laude* can be mentioned on the Master's certificate on the following conditions:
 - a. The average grade for all parts of the Master's examination programme has to be at least a mark 8.0;
 - b. Those parts of the study programme that were granted exemption or that were not marked with a number are not considered for determination of the average grade.
 - c. Exemptions within the programme may be granted with a maximum of 15 EC
 - d. The Master's thesis (final project) is marked with at least 8.0
 - e. The study programme is completed within 30 months. In the case of a combined programme, the maximum period to be eligible for *Cum Laude* is proportional to the total study load, that is, the number of months does not exceed the total study load in EC's divided by four.

Article 4.14 Fraud and plagiarism

1. The provisions of the Regulations governing Fraud and Plagiarism in the Rules and Regulations of the Examination Board EWI apply in full.
2. Electronic detection software programs may be used to detect plagiarism in texts. In submitting a text, the student implicitly consents to the text being entered into the database of the detection program concerned.

5. Student counselling and study progress

Article 5.1 Administration of study progress and academic student counselling

1. The Dean is responsible for student counselling, which includes informing the student of study opportunities in or outside the programme.
2. Each student is appointed a study adviser
3. The study adviser counsels the student and offers advice on study-related matters, as well as personal problems that may affect his studies if the student so desires.
4. If a student wishes to exercise his right to specific counselling or special facilities, he is required to contact the study adviser. The study adviser will record any agreements made with the student, of which the student and the programme board can derive rights.
5. The following applies to the entitlement to special facilities:
 - a. demonstrable force majeure or personal circumstances;
 - b. if necessary and possible, dispensation for participation of exams or tests and/or the availability of special facilities with regards to examination. Such dispensation and additional testing opportunities can only be granted by the Examination Board.
6. Every student has a list of the results achieved put at his/her disposal in SIS. The student can request a certified study progress overview from the Student Services Desk if required.

Article 5.2 Adaptations for students with a disability

1. A disability is a physical, sensory or other impairment that might limit the student's academic progress.
2. It is explored in consultation with the student and on the basis of an interview with the study adviser what adjustments as referred to in Article 2 of the Equal Treatment Act on the basis of a Handicap/Chronic Illness (WGB h/cz) are considered most effective for this student.
3. Adjustments are intended to remove specific obstructions when following the degree programme and/or sitting interim examinations. Where necessary, these may concern facilities pertaining to the accessibility of infrastructure (buildings, classrooms and teaching facilities) and study material, changes to examinations, alternative courses or a custom study plan. Realizing the attainment targets must be guaranteed when implementing changes.
4. On the basis of the interview described in paragraph 2, the student submits a written application for the facilities in consultation with the study adviser. The application is submitted to the Dean of the Faculty, preferably three months before the student is to participate in classes, exams and tests for which the facilities are required.
5. The application is supported by documents that can reasonably be requested to assess the application (such as a doctor's or psychologist's letter or, in case of dyslexia for example, a report by a testing bureau registered with BIF, NIB or NVO).
6. The Dean of the Faculty makes a decision, within twenty working days of receipt of the application or earlier if the urgency of the application necessitates it, on the validity of the application as described in paragraph 4, and informs the student and the study adviser of his decision.
7. The study adviser ensures that the relevant parties involved are informed in due time of the facilities granted to the student with a disability.
8. Should the Dean of the Faculty turn down the application in full or in part, the Dean will inform the student of the reason at the basis of this rejection and the possibilities for lodging an objection or an appeal. Objections must be submitted in writing within six weeks, of the decision being announced to the relevant party, at the Complaints Desk at Student Services.
9. Should extra facilities be granted, it will be stated for what term this grant will apply. The applicant and the study adviser will evaluate the facilities before the end of this term. During this evaluation, the parties will discuss the effectiveness of the facilities provided and whether they should be continued.
10. If additional time for a test is granted e.g. in case of dyslexia, an additional period of 15 minutes for every clock hour is allowed.

6. Amendments, transitional arrangements, appeals and objections.

Article 6.1 Conflicts with the regulations

If other additional regulations and/or provisions pertaining to teaching and/or examinations conflict with these Education and Examination Regulations, the present Education and Examination Regulations take precedence.

Article 6.2 Administrative errors

If, following the publication of an interim examination result, a list of marks, or an overview of a student's progress, an apparent error is discovered, the discoverer, be it the university or the student, is required to make this known to the other party immediately upon finding the error and to cooperate with rectification of the error.

Article 6.3 Amendments to the regulations

- 1) Substantive amendments to these Education and Examination Regulations are determined by the Dean in a separate decision.
- 2) In principle, substantive amendments to these Regulations do not apply to the current academic year. Substantive amendments to these Regulations may apply to the current academic year if the interests of the students are not prejudiced within reasonable bounds, or in situations of force majeure.
- 3) Amendments to these Regulations have no effect on earlier decisions of the Examination Board.
- 4) Transitional arrangements are made in accordance to Article 6.4.

Article 6.4 Transitional arrangement; examination opportunities

- 1) In the case of amendments to the Education and Examination Regulations, the Dean may decide on a transitional arrangement.
- 2) The transitional arrangement will be published in the programme-specific section B.
- 3) Points of departure for a transitional arrangement if a degree programme is changed:
 - a. Changes to a degree programme are published before the start of the academic year in which they are to apply.
 - b. No guarantee can be given that all the units of study of a degree programme, as they existed at the time of a student's enrolment in a programme, will continue to be part of his degree programme. The degree programme as most recently approved by the Dean serves as the basis for establishing the results of the Bachelor's examination.
- 4) The transitional arrangement will always include:
 - a. which lapsed units of study are equivalent to units of study or components thereof in the current degree programme included in the programme appendix; that if a unit of study without practical exercises is removed from the programme, there will be at least two opportunities in the subsequent academic year to take a written or oral exam or to obtain an assessment by some other means;
 - b. that if a unit of study that involves practical exercises is removed from the programme, and during the subsequent academic year no opportunities are offered to carry out these practical exercises, at least one unit of study is designated as a suitable replacement for the lapsed unit of study;
 - c. the term of validity of the transitional arrangement.
- 5) The transitional arrangement requires the approval of the Examination Board pursuant to the provisions of paragraph 4.
- 6) In exceptional cases, and if this is to the student's advantage, the Examination Board may allow a deviation from the number of times and the way in which interim examinations may be taken for a unit of study that is no longer included.

Article 6.5 Review of the education and examination regulations

- 1) The Dean is responsible for the regular review of the Education and Examination Regulations and takes into account the resultant study load for the students to enable this to be monitored and adjusted if necessary.
- 2) In accordance with Article 9.18 of the WHW, the Programme Committee is responsible for issuing advice on the Education and Examination Regulations as well as the annual assessment of the manner in which the Education and Examination Regulations are implemented.

Article 6.6 Appeal and objections

An appeal against a decision made by the Examination Board or an examiner, and objections to decisions made by the Dean on the basis of these Regulations, must be submitted in writing to the Complaints Desk at Student Services within six weeks after notification of the decision.

Article 6.7 Hardship clause

In the event of demonstrable, considerable unreasonableness and unfairness, the Examination Board can permit departures from the provisions of these Regulations.

Article 6.8 Publication

The Education and Examination Regulations and the Rules and Regulations of the Examination Board are published via the website of the programme in question.

Article 6.9 Commencement

These Regulations take effect on 1 September 2016 and supersede the Regulations of 1 September 2015.

SECTION B - PROGRAMME-SPECIFIC SECTION ELECTRICAL ENGINEERING

1 General Provisions

Article 1.1 Definitions

In addition to the definitions in Section A, Article 1.2, the following definitions are used in this Section B:

- a. **Electrical Engineering discipline:** The group of chairs of the Faculty of Electrical Engineering, Mathematics and Computer Science, belonging to the discipline according to the Regulations of the Faculty. In this section also the following chairs are assumed to belong to the discipline as they take part in the Electrical Engineering master's programme: DACS, CAES, SCS and OS (chair within the Science and Technology faculty).
- b. **Programme mentor:** a staff member, who is appointed by a chair to supervise students who joined the specialisation of this chair, until they start their Master's Final project.

2 Programme objectives and final attainment targets

Article 2.1 Aim of the programme

The programme aims to train master students in a spectrum of professional and personal competencies to enable them to expand their knowledge and methodology in design, through analysis and research, of innovative systems in the Electrical Engineering discipline.

Article 2.2 Final qualifications

A Master of Science in Electrical Engineering has the following competencies:

- A master has specialized advanced knowledge in at least one of the specialisations of Electrical Engineering as described below.
- A master has experience in working in industry-related projects and has acquired the ability to be effective in a multidisciplinary environment.
- A master is able to work at the frontier of research and design, and is innovative, contributing to breaking the frontiers of current technology or understanding.
- He/she defines his/her own design/research goals within the limits of his/her project, judges which parts of the problem need further analysis, carries out these analyses on an abstract level, proposes experiments and carries them out in a methodologically correct way.
- A master is able to understand, on a general level, areas adjacent to his/her own area of specialization and use this understanding in the context of his/her own work. He/she is able to appreciate new knowledge of other disciplines (if necessary also of non-technical areas) and to integrate this in his/her work.
- A master can carry responsibility as a leading member of a multidisciplinary design (or research/development) group and develops a broad scope, e.g., with respect to the economic aspects of his/her work, or the impact of technological innovation on society. He/she is a serious partner in discussions on aspects regarding the setting and societal environment of his/her work.

Compared to the bachelor level, a master has more specialized knowledge and abilities, more industrial experience and has skills to independently solve relatively complex problems.

Article 2.3 Specialisations

There is only one master's programme in Electrical Engineering and the field of specialization determines the contents of the programme. This specialisation is defined by the chair where the master thesis is carried out. The course programme corresponds to the specialisation. In this way graduates maintain a

broad Electrical Engineering qualification while being specialized in one of the specific fields. The field of specialization is indicated in the addendum of the degree diploma.

The following specialisations are defined in the Electrical Engineering programme:

Specialisation	Name of the chair	Abbreviation
lab-on-a-chip systems for biomedical and environmental applications	Biomedical and Environmental Sensorsystems	BIOS
neurotechnology and biomechatronics	Biomedical Signals and Systems	BSS
dependable integrated systems	Computer Architecture for Embedded Systems	CAES
robotics and mechatronics	Robotics & Mechatronics	RAM
communication networks	Design and Analysis of Communication Systems	DACS
integrated circuit design	Integrated Circuit Design	ICD
integrated optical microsystems	Optical Systems	OS
nanoelectronics	NanoElectronics	NE
computer vision and biometrics	Services, Cybersecurity and Safety	SCS
devices for integrated circuits	Semiconductor Components	SC
telecommunication engineering	Telecommunication Engineering	TE
micro sensors and systems	Micro Sensors and Systems	MSS

3 Further admission requirements

See Section A, Chapter 2, for general regulations regarding admission and enrolment

Article 3.1 Programme specific admission requirements

1. Admission to the Master's programme is possible for an individual who can demonstrate that he/she has the knowledge, understanding and skills as defined in the Attainment Targets of the Electrical Engineering Bachelor's programme of the University of Twente as described in Article A2 of the Programme Specific Part of the Education and Examination Regulations for the Bachelor's Degree Programme in Electrical Engineering.
2. Any individual who has obtained a Bachelor's degree in academic higher education on one of the following degree programmes meets the requirements referred to in paragraph 1:
 - a. Bachelor's programme Electrical Engineering at the University of Twente.
 - b. Bachelor's programme Electrical Engineering at the Technical University of Delft.
 - c. Bachelor's programme Electrical Engineering at the Technical University of Eindhoven.

Article 3.2 Pre-Master's programme for students from a Dutch institute of professional education

See Section A, Article 2.7, for general regulations regarding pre-master's programmes.

1. Students seeking admission on the basis of a Bachelor's degree awarded by a Dutch institute of professional education must complete a bridging programme that includes the following subjects:

Code	Course	Study load (EC)
201500291	Calculus A	5
201500292	Linear Algebra	3
201500252	Digital Logic and Computer Organization	3
201500293	Calculus B	4
191231490	Linear Systems	6
191403070	Electricity & Magnetism HBO	5
201400279	Academic Research Skills	4
	Total	30

2. Small changes in the programme are possible. The final programme should be announced to the students before the start of the programme.
3. The programme assumes a minimal knowledge level VWO-B on mathematics and a VWO-level English. (VWO being the Dutch preparatory secondary school for the universities).
4. The conditions for admission to the master's programme are as stipulated in Section A, Article 2.7.
5. Students from a Dutch institute of professional education may be allowed by the Admissions Committee to follow the pre-Master's programme as a part of their bachelor's programme.

4 Curriculum structure

Article 4.1 Composition of programme

The curriculum consists of the following elements:

Year	EC	Topic
First	20	Compulsory units of study
	5..10	Philosophical and Societal courses
	30..35	Electives (Including possible homologation courses)
Second	20	Internship
	40	Master's thesis project

Article 4.2 Compulsory units of study

The compulsory units of study depend on the specialisation, chosen by the student. The list of compulsory courses is given for each specialisation in Appendix I. Any departure from this will require the permission of the examination board.

Article 4.3 Philosophical and Societal courses

The units Philosophy of Engineering, Science (201400178) and Philosophy of Engineering, Ethics (201100137), worth 5 EC in total, are compulsory. Students can choose the other 5 ECs from non-technical units with a workload of at least 3 EC provided by any university. If students so desire, they can also complete 5 ECs in a technical subject. The examination committee can, in response to a written request from a student, allow 10 EC to be completed entirely or partially in some other way, in the event of grounds based on the student's previous education or other knowledge and experience obtained.

Article 4.4 Electives

Students shall select their elective units, after consultation with the programme mentor responsible from the chosen specialisation, from the following list:

- University of Twente: the master's subjects, offered by the studies in Electrical Engineering, Embedded systems, Computer Science, Applied Mathematics, Mechanical Engineering, Applied Physics and Nanotechnology.
- The Technical University in Delft and the Technical University in Eindhoven: the master's subjects, as listed for the study in Electrical Engineering.
- If subjects are included that do not fulfil the above, then permission will have to be obtained from the examination board.

The programme of electives requires approval by the programme mentor.

Article 4.5 Homologation courses

The rules for homologation courses are stipulated in Section A, Article 2.6.4.

Article 4.6 Internship

The general regulations for the internship are stipulated in section A, Article 3.4 and 3.5.

1. The Admission Committee can decide that the internship will be replaced by an individual research project in one of the research groups participating in the programme. The study load of the project is 10EC. The remaining 10EC of the internship will be spent to elective courses. This decision will be taken if during the bachelor's programme the student acquired substantial working experience from one or more internships and the student lacks project experience in a research group.

Article 4.7 Master's final project (master's thesis)

The general regulations for the master's final project are stipulated in section A, Article 3.3.

1. A student will carry out the final project subject to the accountability of the chair of the Electrical Engineering discipline responsible for the student's specialisation.
2. A description of the Master's project that a student will do must have been drawn up and approved by an expert member of the scientific staff of the chair, mentioned in paragraph 1, and who is permanently employed in the Electrical Engineering discipline.
3. The committee that supervises the Master's project is formed by a minimum of 3 persons, at least two of whom are members of the scientific staff and have a permanent position in the Electrical Engineering discipline and one is responsible for day-to-day guidance. Of these two members, one is a full or associate professor of the chair subject to whose accountability the project will take place. The supervisory committee shall also include one member of the permanent scientific personnel of a different chair than that under which the student is studying.

4. The committee referred to in paragraph 3 appoints a daily supervisor.
5. The Master's final project shall take place according to a planning as stipulated in section A, Article 3.3.
6. The Master's project will normally be carried out within the chair that is responsible for the project in accordance with paragraph 2. A Master's project may only be carried out external to one of the chairs of the Electrical Engineering discipline, subject to the explicit accountability of one of the chairs of the Electrical Engineering discipline. The chair concerned carries out supervision as described in the paragraphs of this Article and in Section A, Article 3.3. The programme director regards the project as being carried out by the chair concerned. If a project is carried out external to the chair, this should be reported in advance to the examination board.

Article 4.8 Sequence of examinations

1. There are no general conditions regarding the sequence in which the course units have to be followed. Prior knowledge requirements may be given in the individual course descriptions that can be found in the study prospectus. The student should take them into account when planning the study programme.
2. In addition to section A, Article 3.4.2, the internship can only take place if the compulsory units and the unit Philosophy of Engineering (Ethics plus Science) have been completed with satisfactory results.
3. Conditions for starting the master's thesis are stipulated in Section A, Article 3.3.

5 Planning, procedures and guidance during the Master's study

Article 5.1 Specialisation and subject combination

1. Before starting the master's study, students choose one of the specialisations of the programme and with this the chair of the Electrical Engineering discipline where the final project will be carried out. The student determines his package of subjects, together with the programme mentor of the chair, and draws up a schedule for attending the subjects, and for carrying out the work placement and the final project.
2. The consultation referred to in Paragraph 1 results in a study plan that will be signed by both the student, and the programme mentor.
3. The package of subjects should be approved by the programme mentor and then submitted to the registry of the examination committee, at the latest by six months after the start of the master's study.
4. An alteration in the package of subjects may only be made with the programme mentor's agreement. If the package of subjects has already been submitted to the registry of the examination committee then any alterations should be reported to the registry immediately.

Article 5.2 Practical exercises

1. The study prospectus states which units include a practical exercise. If a unit involves a practical exercise, the examiner will give an assessment, by the latest, at the end of the period in which the subject is scheduled. This will be used to arrive at the final mark for that unit. If the results for the practical exercise are unsatisfactory, then the student has time available until the end of the next quarter to complete the exercise with a satisfactory result. If satisfactory results have still not been obtained, then the student can only obtain satisfactory results for the exercise by doing it over in full.
2. The assessments of the practical exercises can only be obtained after the student has participated in the exercise concerned.

Article 5.3 Internship

The rules for the internship are stipulated in Section A, Article 3.4

Article 5.4 Master's final project

1. The student and the (day-to-day) supervisor of the chair must make an appointment about the starting and finishing dates of the Master's project.
2. The finishing date is obtained on the basis of a planning, whereby time shall be set aside not only for the Master's project but possibly also for attending subjects and for taking resits.
3. The planning must be approved by the supervisor and signed by the student.
4. No more than the nominal amount of time may be planned for working on the Master's project.
5. Students should report illness immediately to the secretariat of the chair. Time that is missed due to illness shall be added to the time available for the Master's project in the study plan.
6. The supervisor should approve any extra time required for re-taking an interim examination and incorporate it into the study plan. Time that has to be spent on a resit shall be added to the time available for the Master's project.
7. In the study plan the student and the supervisor should make appointments about how the student should spend his time during any academic holiday periods.
8. Sufficient time should be added to the study plan to compensate any delays that arise due to reasons for which the student is not to blame.
9. Immediately after the final date of the project as recorded in the study plan (including any adjustments as described in paragraphs 5 to 8), the supervisory committee shall issue an opinion on how the project was carried out and determine the final mark.
10. If this final mark is a fail then the student must carry out a supplement to the project within a period of two months, after which the supervisory committee will state its opinion again, which will lead at the most to a 6.
11. This new final mark will be regarded as the result of a resit.
12. If the result of a resit is a fail, then the student shall have to carry out another, new, Master's project.

Article 5.5 Study counselling

Regulations for study counselling are stipulated in Section A, Chapter 5.

6 Special opportunities

Article 6.1 Extended examinations.

1. Whosoever, either before or after passing the final examination of an EE master's study, has successfully taken interim examinations for units that are not or were not considered part of this study or a different study, but which could have been part of the said master's studies, will be examined, upon request, subject to the approval of the examination committee, in the form of an extended examination.
2. As proof that the extended examination has been completed successfully, the examination committee can, upon request, issue a separate statement.

Article 6.2 Size and composition of the Flexible Degree programme

General regulations for flexible degree programmes are stipulated in Section A, Article 3.6.

1. The flexible degree programme shall include at least one unit comparable with the Master's final project of the EE master's study; this unit shall have a workload of no less than 30 EC and no more than 50 EC.
2. The flexible degree programme can include a unit that is comparable with the Company work placement of the EE master's study; this unit shall have a workload of no less than 20 EC and no more than 30 EC.
3. The flexible degree programme can include a short individual project amounting to 10 or 15 EC.
4. The examination committee can decide not to grant permission if both units referred to in paragraphs 2 and 3 exist in the proposed programme.

Article 6.3 Goal and requirements for Flexible Degree programmes

1. The goal of a Flexible Degree programme is to enable students to compile courses that go beyond the borders of course disciplines and in which various disciplines are represented in a well-balanced manner.
2. A Flexible Degree programme should have a well-defined goal.
3. A Flexible Degree programme should achieve a level comparable with that of the programme to which it is regarded as belonging, as evident from the following conditions:
 - a. the presence of units from the same programme phase of the various disciplines;
 - b. the presence of a final project, comparable with the final project of the programme to which the Flexible Degree programme is regarded as belonging.
4. A Flexible Degree programme should reflect inherent cohesiveness.
5. A Flexible Degree programme that can be regarded as belonging to the Electrical Engineering programme master's programme contains a substantial number, in the order of 20%, of the subjects for this programme.
6. An applicant who submits a Flexible Degree programme can include a number of electives, to be chosen later from a list attached to his request. These electives will have to be approved by the committee that will assess the final project.

Article 6.4 Double degree programme

Regulations for study counselling are stipulated in Section A, Article 3.7

APPENDIX I - SPECIALISATIONS AND THEIR COMPULSORY COURSES

Lab-on-a-chip systems for biomedical and environmental applications

Code	Course	Study load (EC)
191211120	Lab on a Chip	5
191210720	Biomedical Signal Acquisition	5

Two more compulsory courses will be chosen by the programme mentor from the following list, after discussion with the student:

Code	Course	Study load (EC)
101210740	Material science	5
191211080	Systems engineering	5
191210730	Technology	5
191211300	Micro electro mechanical systems design	5
193400121	Nanofluidics	5

Neurotechnology and biomechatronics

Code	Course	Study load (EC)
191211350	Neurophysiology	5
191211690	EM Statics	5
191210720	Biomedical Signal Acquisition	5
193810020	Advanced Techniques for Signal Analysis	5

Dependable integrated systems

Code	Course	Study load (EC)
191210750	System-on-Chip Design	10
192130240	Embedded Computer Architectures 1	5

One more compulsory course will be chosen by the programme mentor from the following two, after discussion with the student:

Code	Course	Study load (EC)
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192130092	Faulttolerant Digital Systems	5
191210760	Advanced Programming	5

Robotics and mechatronics

Code	Course	Study load (EC)
191210770	Digital Control Engineering	5
191210760	Advanced Programming	5

Two more compulsory courses will be chosen by the programme mentor from the following six, after discussion with the student:

Code	Course	Study load (EC)
191211090	Real time software development	5
191211110	Modelling and Simulation	5
191211060	Modern Robotics	5
191210910	Image Processing and Computer Vision	5
201400427	Transducers Science	5
191211690	EMstatics	5

Communication networks

Code	Course	Study load (EC)
192620010	Mobile and Wireless Networking 1	5
192620300	Performance Evaluation	5
192654000	Network Security	5

One more compulsory course will be chosen by the programme mentor from the following ones, after discussion with the student:

Code	Course	Study load (EC)
201400177	Cloud Networking	5
192653100	Internet Management and Measurement	5
201400176	Dependable Networking	5

192620020	Mobile and Wireless Networking 2	5
192130500	Quantitative Evaluation of Embedded Systems	5
201400175	Social networks ^{*)}	5

*) If available

Integrated circuit design

Code	Course	Study load (EC)
191210750	System-on-Chip Design	10
191210850	Advanced Analog IC-Electronics	5

One additional compulsory course will be chosen by the programme mentor from the following list, after discussion with the student:

Code	Course	Study load (EC)
191210870	Integrated Circuits and Systems for mixed signals	5
191211500	Wireless Transceivers Electronics	5
191210840	A/D Converters	5
191210860	Project Advanced Electronics	5
191211720	Microwave Techniques	5

Integrated optical microsystems

Code	Course	Study load (EC)
193400131	Nano-optics	5
191210880	Integrated optics	5

Two more compulsory courses will be chosen by the programme mentor from the following ones, after discussion with the student:

Code	Course	Study load (EC)
191210411	Electrodynamics	5
191210740	Materials science	5
191211080	Systems engineering	5

191210730	Technology	5
193520030	Non-linear optics	5
201300139	Laser physics	5
193530020	Advanced materials	5

Nanoelectronics

Code	Course	Study load (EC)
193400141	NanoElectronics	5
191211000	Advanced Semiconductor Devices	5
191210740	Materials Science	5
191210730	Technology	5

Computer vision and biometrics

Code	Course	Study load (EC)
191210910	Image Processing and Computer Vision	5
201100254	Advanced Computer Vision and Pattern Recognition	5
191210900	Introduction to Biometrics	5
201300239	Machine Learning Short Course	5

Devices for integrated circuits

Code	Course	Study load (EC)
191210730	Technology	5
191211440	Integrated Circuit Technology	5
191211000	Advanced Semiconductor Devices	5

One additional compulsory course will be chosen by the programme mentor from the following list, after discussion with the student:

Code	Course	Study load (EC)
191210740	Material Science	5

191210750	System-on-Chip Design	10
191210850	Advanced Analog IC Electronics	5
193400141	Nanoelectronics	5

Telecommunication engineering

Code	Course	Study load (EC)
191211030	Mobile Radio Communication	5
191210780	Modern Communication Systems	5
191211040	Electromagnetic Compatibility	5
201200231	Smart Antennas and Propagation	5

Micro sensors and systems

Code	Course	Study load (EC)
191211300	Micro Electro Mechanical Systems Design	5
191210930	Measurement Systems for Mechatronics	5

Two more compulsory courses will be chosen by the programme mentor from the following ones, after discussion with the student:

Code	Course	Study load (EC)
191210740	Materials Science	5
191131360	Design Principles for Precision Mechanisms	5
191210730	Technology	5
191211690	EMstatics	5