

EDUCATION AND EXAMINATION REGULATIONS

MASTER'S DEGREE PROGRAMMES EEMCS

A. FACULTY SECTION

B. PROGRAMME-SPECIFIC SECTION

2024-2025 academic year

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

General

The Dutch Higher Education and Research Act (Dutch abbreviation: WHW) of 1993 requires a broad outline of the teaching programme and examining for each degree programme to be recorded in the Education and Examination Regulations (EER (Dutch: OER)).

In accordance with Section 7.13, Paragraph 1, of the WHW, the EER must contain sufficient and clear information about the degree programme or group of programmes to which they apply. Section 7.13, Paragraph 2, of the WHW lists those issues that must, as a minimum, be stipulated in the EER with respect to procedures, rights and responsibilities relating to the education and examinations that are part of each degree programme or group of programmes. The WHW also includes a number of separate obligations relating to the inclusion of rules within the EER.

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

The EER is part of the UT Student Charter, which governs the rights of students and the way we treat each other at the UT. It gives an overview of the rights and obligations of our students and of the academic provisions. The charter consists of two parts: 1) the institutional section which applies to all students, irrespective of the programme and 2) the programme section, which is different for each programme and can be found in the Education and Examination Regulations (EER).

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SECTION A: FACULTY SECTION

A1 General provisions

Article A1.1 Applicability of these Regulations

1. This Faculty Section A contains general provisions that apply to education and examinations for all students in the following Master's degree programmes: Applied Mathematics, Business Information Technology, Computer Science, Electrical Engineering, Embedded Systems, Interaction Technology, Systems & Control, and Robotics (hereinafter referred to as: the Master's programmes) 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. Each Master's programme also has its own Section B.
3. Section B of these Education and Examination Regulations may include additions to the general provisions in Section A only applicable to that specific programme.
4. Together the Faculty Section A and the Programme-specific Section B form the Education and Examination Regulations for the Master's programme concerned.
5. The Education and Examination Regulations apply to anyone enrolled in the Master's programmes, irrespective of the academic year in which the student first enrolled in the programme.
6. The Education and Examination Regulations also apply *mutatis mutandis* to the joint Master's degree programmes and study units provided by the faculty, pursuant to Section 7.3c of the WHW.
7. The general provisions and the programme-specific provisions to the Education and Examination Regulations are determined by the Faculty Board.
8. Students attending study units organised by another programme¹ are subject to the assessment rules laid down in the assessment schedule of the study unit concerned, in the Education and Examination Regulations and in the Rules and Guidelines of the Examination Board of the programme that organises the study unit. Special facilities according to article A7 can only be granted by the programme for which the student is enrolled.
9. The Examination Board sets down rules with regard to the execution of its tasks and powers in accordance with Section 7.12b of the WHW. These regulations are specified in the Rules and Guidelines of the Examination Board and include provisions about the rules of order during tests and rules in case of emergencies.
10. The institute section of the [Student Charter](#) includes a definition of what the University of Twente considers to be academic misconduct (fraud). The Rules and Guidelines of the Examination Board for the Master's programme in question include additional rules about academic misconduct (fraud), such as which measures the Examination Board may take if it establishes misconduct (fraud).
11. Requests for exemptions in respect of provisions laid down in the Education and Examination Regulations should be submitted to the Examination Board or the Programme Director of the student's own programme, as laid down in the relevant articles of these Regulations.

¹ This does not apply, unless otherwise agreed, for units that are organised by a programme specifically for another programme, so-called service education.

Article A1.2 Definitions

The terms used in these Regulations should be interpreted as follows:

- a. **Academic year:** The period beginning on 1 September and ending on 31 August of the following calendar year.
- b. **Admission Board:** The committee that assesses, on behalf of the Faculty Board, whether a candidate meets the requirements for admission to the Master's programme of their choice. If no Admission Board has been appointed for the programme, the Programme director functions as the Admission Board.
- c. **Assessment schedule:** a schedule showing the method of assessment for a study unit.
- d. **Combined Programme:** A programme of courses representing an amalgamation of two separate study programmes and covering the requirements and the programme intended learning outcomes of both individual Master's programmes, yielding two degrees.
- e. **Course catalogue:** The guide for the Master's programme concerned that provides further details of courses and other information specific to the programme. The course catalogue is available at www.utwente.nl/coursecatalogue.
- f. **Course:** A study unit of the programme, as defined in Article 7.3, Paragraph 2 and 3 WHW.
- g. **Credit (EC):** A unit of 28 hours of study load, in accordance with the European Credit Transfer System; a full academic year consisting of 60 EC or 1680 hours (Article 7.4 WHW).
- h. **Curriculum:** The aggregate of required and elective study units constituting a degree programme as laid down in Section B.
- i. **Double degree:** two degrees awarded by two institutions of higher education that offer a joint study programme; the joint programme covers the programme intended learning outcomes of both programmes.
- j. **Examination (also: exam):** An evaluation, performed to conclude a study unit, of the student's knowledge, understanding and skills as well as an assessment of the outcomes of that evaluation (Article 7.10 WHW); an examination may consist of a number of tests.
- k. **Examination programme:** All study units of a study programme counting towards the degree.
- l. **Examination Board:** The body that objectively and professionally assesses whether a student meets the conditions laid down in the Education and Examination Regulations regarding the knowledge, understanding and skills required to obtain a degree (Article 7.12 WHW).
- m. **Examiner:** The individual appointed by the Examination Board to administer examinations and tests and to determine the results, in accordance with Article 7.12 Paragraph c WHW.
- n. **Exemption:** The decision of the Examination Board that the student has knowledge and skills which are comparable in terms of content, scope, and level with one or more study units or components of study units. An exemption is granted based on acquired competencies, i.e., previously passed examinations in higher education or in view of knowledge and skills attained outside higher education.
- o. **Executive Board:** Executive Board of the University of Twente.
- p. **Faculty Board:** Head of the faculty (Article 9.12, Paragraph 2 WHW).
- q. **Final Examination:** A degree programme is concluded with a final examination. If the study units in the degree programme have been completed successfully, then the final examination is deemed to have been completed (Article 7.10 WHW).
- r. **Fraud and plagiarism:** Fraud is an act or omission by a student designed to partly or wholly hinder the accurate assessment of their own knowledge, understanding and skills, or those of another

person. Fraud includes plagiarism, which is the use of someone else's work without including a correct reference to the source. See the Student Charter of the UT for further details.

- s. **Higher Education and Research Act (abbreviated to 'WHW')**: The Dutch Higher Education and Research Act, Bulletin of Acts and Decrees 1992, 593, and its subsequent amendments.
- t. **Homologation**: Study units that can be offered to students who are admitted to the master's programme but who nevertheless have insufficient knowledge, understanding or skills, according to Article 7.30b. WHW.
- u. **Learning Management System (LMS)**: System that supports online learning and teaching. In this case: Canvas.
- v. **Master's programme (also: programme)**: The Master's degree programme, as referenced in Article 7.3a Paragraph 1 subparagraph b WHW: the entirety of the course components, teaching activities/methods, contact hours, testing and examination methods and recommended literature.
- w. **Master's thesis project / final project**: A study unit comprising literature research and a contribution to scientific research, which always results in a written report.
- x. **Practical assignment**: A practical assignment as referred to in Article 7.13, Paragraph 2d WHW is a study unit or a study unit component emphasising an activity that the student engages in, as described in Section B.
- y. **Pre-Master's programme (also: Bridging programme)**: A combination of study units that can be offered to students who cannot yet be admitted to the Master's programme due to insufficient knowledge, understanding or skills, in accordance with Article 7.30e. WHW.
- z. **Programme Committee (PC)**: Committee referred to in Article 9.18 WHW.
- aa. **Programme Director**: The person appointed by the Faculty Board to administer the programme (Article 9.17 WHW).
- bb. **Quarter (also: quartile)**: A part of a semester as specified in the academic calendar of the university.
- cc. **Semester**: Half an academic year, as specified in the academic calendar of the university.
- dd. **Senior Examiner**: Specific examiners, appointed by the Examination Board to take the role as chair of an assessment committee for the final Project.
- ee. **Student Information System (SIS)**: System designated by the Executive Board for registration and for providing information on all relevant data related to students and the programme, as referred to in the WHW. In this case: Osiris.
- ff. **Student**: Anyone enrolled in a programme in accordance with Article 7.34 and 7.37 WHW.
- gg. **Study Adviser**: Person appointed by the Faculty Board who acts as contact between the student and the university, and in this role represents the interests of the student, as well as fulfilling an advisory role.
- hh. **Study load**: The time an average student needs to learn the course material. The study load comprises project work, independent study, lectures and writing assignments, for example. The study load is expressed in credits according to the European Credit Transfer System, where 1 credit equals 28 hours.
- ii. **Study Programme**: All study units followed by the student as part of their Master's degree programme.
- jj. **Study unit**: A programme component as defined in Article 7.3, Paragraph 2 and 3 WHW. Also referred to as course.

- kk. Teaching Period:** The period in which a study unit is offered. This period starts in the first week in which an educational activity takes place for the study unit concerned and ends in the final week in which an educational activity takes place and/or a test is administered for the study unit concerned. Resits are not part of the teaching period. This period may sometimes not be the same as a quartile (quarter of an academic year).
- ll. Test:** An evaluation of the student's knowledge, understanding and skills as well as an assessment of the outcomes of that evaluation. A test is part of an examination. If the examination for a study unit consists of a single test, then the result of that test will count as the result of the examination in accordance with Article 4.7 WHW.
- mm. UT:** The University of Twente (UT).
- nn. Working day:** Any day from Monday to Friday with the exception of public holidays and the prearranged compulsory holidays ('brugdagen') on which the staff are free.

The definition of all other terms used in these Regulations is in accordance with the definition accorded by the main text of this document, the programme-specific section of the EER, the student charter or the WHW.

A2 Previous education and admission

Article A2.1 Previous education

1. In order to qualify for enrolment in a Master's programme, either a Bachelor's degree obtained through academic higher education (WO) is required, or a Bachelor's degree from a university of applied sciences (HBO) in addition to the successful completion of an appropriate pre-Master's programme. The requirements that the Bachelor's degree must meet are specified in Section B.
2. The Admission Board of the Master's programme assesses the candidate's suitability for admission to the programme on the basis of the requirements stipulated in Section B.
3. The Admission Board can admit students who lack a limited amount of credits on a topic regarding required prior knowledge, provided they judge that this does not reduce the student's likelihood of successfully completing the programme.
4. The Bachelor's degrees that entitle students to automatic admission are listed in Section B.
5. Additional admission requirements are stipulated in Section B.

Article A2.2 Language requirements

1. To be admitted to the programme, students must be proficient in English.
2. Proof of proficiency in English is required by the successful completion of one of the following examinations or an equivalent:
 - a. IELTS (academic) certificate, not older than two years, with an overall band score of at least 6.5, and a minimum score on each section of at least 6.0.
 - b. TOEFL iBT (internet-based) certificate, not older than two years, with an overall score of 90, and a minimum score on each section of at least 21².
 - c. Cambridge C1 Advanced, formerly known as; Cambridge English Advanced (CAE) from 2015 onwards (when the subscores were introduced) and Cambridge C2 Proficiency,

² By exception, you can also take the TOEFL iBT (Special) Home Edition test (only valid for the September 2024 and February 2025 intake). This is only the case when you cannot use a regular language test as listed in this table because the onsite language test centre is closed because of unsafe situations in your country.

formerly known as; Cambridge English Proficiency (CPE) from 2015 onwards (when the subscores were introduced). Obtained an A, B or C grade, with an overall score of at least 176 and a minimum score on each section of at least 169.

3. Any exemptions to the Language requirement can be found at the [UT Master website](#).

Article A2.3 Application and enrolment

1. The deadline for application for admission to the Master's programme is stipulated on the website www.utwente.nl/master. Different application deadlines apply to different types of applicants.
2. After admission, the student must enrol before 1 September or 1 February thereafter. The rules and regulations regarding enrolment are laid down in the [UT Enrolment Regulations](#).

Article A2.4 Admission Board

Each programme has an Admission Board, which is appointed by the Faculty Board. The Faculty Board appoints this board after consulting with the Programme Directors and Examination Boards of the relevant Master's programmes.

Article A2.5 Admissions procedure

1. The Admission Board is responsible for the admissions to the programme in relation to any students that cannot be admitted directly (see Paragraph A2.1.4).
2. With a view to admission to the programme, the Admission Board assesses the candidate's knowledge, understanding and skills, including relevant language skills. The Board may request experts from inside or outside the University to test certain types of knowledge, understanding and skills, in order to supplement written evidence from the degree programmes the student has already completed.
3. In addition to the requirements, the Admission Board also assesses requests for admission on the basis of the following documents:
 - a. motivation letter;
 - b. English proficiency scores according to Article A2.2;
 - c. Diploma;
 - d. transcript of records;
 - e. curriculum vitae;
 - f. abstract of (Bachelor) thesis;
 - g. course descriptions for programme-specific courses, research methodology courses, mathematics courses and a table of content for the course materials.
4. The Admission Board may decide that particular units must be included in the student's study programme to compensate for lack of knowledge on the part of the student (homologation courses).
5. Candidates receive either confirmation of their 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 Complaints Desk within six weeks.

Article A2.6 Refusal or termination of enrolment (unsuitability/judicium abeundi)

1. Based on the provisions of Section 7.42a of the WHW, the Faculty Board or the Examination Board may, in exceptional cases, ask the Executive Board to terminate or refuse a prospective student's enrolment in a programme, if that student's actions or words show that the student is unsuitable either for practising one or more of the professions for which the programme in question would prepare the student or for practical preparations for professional practice.

2. If it is believed that a prospective student is unsuitable for the programme, as described in Paragraph 1, the Examination Board or the Faculty Board will initiate an inquiry, and the student is informed of this promptly. The Examination Board or the Faculty Board does not issue any recommendation without carefully considering the interests involved and giving the prospective student the opportunity to be heard.

Article A2.7 Pre-Master's programme

1. The Admission Board may decide to admit a candidate to the Master's programme on the condition that a pre-Master's programme is completed successfully before their admission.
2. A pre-Master's programme is a bridging programme with a study load of 15 or 30 ECs, to be decided by the Admission Board. The courses in the pre-master are subject to the Bachelor Education and Examination Regulations.
3. The pre-Master's programme is assembled by the Admission Board. A fixed programme may be defined for specific groups of students. However, a student may also be given a personalized programme.
4. Proof of the successful completion of the pre-Master's programme, together with the related Bachelor's degree, serves as proof of admission to the relevant Master's programme, in the same and in the subsequent academic year.
5. Candidates are required to complete the pre-Master's programme within a year unless otherwise specified.
6. Students from Dutch Universities of Applied Sciences may be allowed to attend a pre-Master's programme during their Bachelor's programme. Paragraph 5 applies to these students. In this case, the relevant Bachelor's degree, together with the successfully completed pre-Master's programme, serves as proof of admission to the relevant Master's programme.

A3 Programme content, structure, and rules

Article A3.1 Aim of the programme

The qualities relating to the knowledge, understanding, and skills that the student should have acquired upon completing the programme (aims and learning outcomes) (Article 7.13 Paragraph 2 (a) of the WHW) are set out in Section B.

Article A3.2 Programme structure

1. Section B describes the Master's programme in accordance with Article 7.13, Paragraph 2 WHW.
2. The scope of the Master's programme is at least 120 EC. These 120 credits must not include any courses for which credits have been obtained during a previous UT Bachelor's programme.
3. Registration is required prior to participating in a study unit, this is only possible for students during the periods designated for that purpose.
4. Every Master's programme has a nominal duration of two years, with each year divided into two semesters, both divided into two quarters³
5. Master's programmes are taught on a full-time basis.

³ See www.utwente.nl/en/ces/planning-schedules/academic-calendar/academic-calendars/ for a more detailed explanation of the academic calendar at the UT.

Article A3.3 Language of Instruction

1. The language of instruction for all EEMCS Master's programmes is English.

Article A3.4 Exemptions

1. The Examination Board may grant an exemption to students at their request for one or more examinations or tests. To this end, the student should demonstrate having sufficient knowledge and skills in relation to the examination concerned or the test in question.
2. An exemption granted by the Examination Board is registered in SIS under the study unit or study units, or components thereof, by means of an EX (exemption).
3. Students cannot be compelled to take additional study units or components of study units in their curriculum instead of an exemption that has been granted.
4. Exemptions may be granted to a maximum of 30 EC.
5. Students may also be exempted from practical assignment if they can demonstrate that a required practical assignment will likely give rise to a personal moral dilemma. In such cases, the Examination Board determines whether the component can be completed in another manner and in what way.

Article A3.5 Flexible-degree programme

1. The Examination Board decides on requests for permission to take a flexible-degree programme as referred to in Article 7.3j WHW. The Examination Board assesses whether a flexible-degree programme is appropriate and consistent within the domain of the educational programme and whether the level is high enough in light of the attainment targets of the programme.
2. The content of the flexible-degree programme is determined and motivated by the student and must be equivalent to a regular Master's programme in terms of scope, breadth and depth.
3. The following requirements must be met in order to be eligible for the Master's degree:
 - a. the deviation from the regular Master's programme must be at least 30 EC while still ensuring coherence in terms of content.
 - b. the level of the programme must match the objectives and programme intended learning outcomes that apply to the programme for which the student is enrolled.

Article A3.6 Combining programmes

1. A student can obtain diplomas for two UT Master's programmes on the basis of a combined programme.
2. Students need to be admitted and enrolled in both programmes in order to combine two programmes.
3. Approval for the programme and overlap in courses is required from the Examination Boards of both Master's programmes
4. The following requirements apply to the composition of a combined programme:
 - a. The programme of courses represents an amalgamation of the separate degree programmes and satisfies the requirements of each individual programme, including the programme intended learning outcomes .
 - b. The study load in EC of the combined programme must be at least 180 credits for two two-year programmes, or 150 credits for a combination of a one-year and two-year programme.
 - c. The maximum overlap in courses outside of the Master's final project(s) is 40 credits.
 - d. The combined programme must include two separate Master's final projects, or one larger combined Master's final project.

- e. Two separate Master's final projects may only be combined into one larger one, if the topic is relevant to both Master's programmes. The study load of this combined Master's final project must be at least 100% of the requirement in EC for the Master's final project of the programme that has the highest number of EC plus at least 50% of the requirement in EC for the Master's final project of the other programme.⁴
- f. In case there is a Standard Programme for a combined study programme defined by two UT Master's programmes, the requirements laid down in the Standard Programme apply.
5. The requirements on examiners and supervision for the internship and Master's final project of both programmes must be met.
6. Students who complete a study programme as described take a combined final examination which they pass if the assessments included in their file would result in a pass for the final examination of both programmes individually in accordance with the applicable regulations. The Examination Boards of the programmes involved decide whether a student passes the final examination. The Programmes provide instructions concerning the date of a combined final colloquium.

Article A3.7 Master's final project

1. Requirements for starting the final project:
 - a. Students must have no more than 10 ECs still to complete, other than the final project.
 - b. As an exception to the rule above, if the programme allows for a combined final project and internship, 10 ECs in unfinished courses other than the internship and final project are allowed.
2. The student and examiner(s) must agree on the start date and completion date for the Master's final project.
3. This agreement is to be documented in a plan that takes into account the nominal length of the final project, a reasonable holiday period and any uncompleted study units.
4. The schedule for completion must be approved by the examiner and signed by the student.
5. The final project is concluded with an oral presentation in public at the University of Twente unless the project is carried out at another university as part of the exit year of a double degree programme.
6. Programme-specific regulations regarding the final project are stipulated in Section B.

Article A3.8 Composition of the assessment committee for the Final Project

1. The committee consists of at least two examiners, of which at least one is senior examiner; it is chaired by a senior examiner.
2. The examiners must belong to at least two different UT research groups.
3. All supervisors of the project are members of the assessment committee. Supervisors who are not examiners serve on the committee in an advisory capacity.
4. The examiners are collectively responsible for grading the thesis. In case of different opinions among the examiners, the chair of the assessment committee takes the ultimate decision on the grade.
5. In the event that the assessment committee cannot meet the above specifications, a motivated request to the Examination Board may be made by the Programme Director. The approval for

⁴ For some EEMCS programmes graduation is divided into a 10EC preparatory study unit and 30EC thesis project. For the purpose of this rule A3.6.4d only, they are considered one single 40EC project.

the particular assignment remains valid during the academic year in which the request was granted or the duration of the final project in question with the maximum of one year.

Article A3.9 Internship

1. The internship is a period of study-related professional practice amounting to 20 EC and is carried out by the student at a company, university, or organization outside the University of Twente.
2. Requirements for starting the internship:
 - a. students must already have obtained at least 45 EC of their examination programme.
 - b. additional requirements may apply for each programme and are stipulated in Section B.
3. A description of the internship must be drawn up and approved by a member of UT staff appointed as examiner. This approval must be obtained before commencing the internship.
4. Students must contact the internship office for an intake at least three months before their preferred start date of the internship.
5. The day-to-day supervisor for the internship is the company supervisor: a member of the organization where the internship is carried out. This supervisor must be named in the project description, mentioned in Paragraph 3.
6. The UT supervisor mentioned in Paragraph 3 supervises the student remotely during the internship. If, in the opinion of this UT supervisor, adequate supervision by the company supervisor is not – or no longer – possible, the UT supervisor may decide to take over as the student's day-to-day supervisor.
7. During the internship, the student writes a report about their work. At the end of the internship period, this report is submitted to the company supervisor. The company supervisor assesses the internship using the relevant assessment form. The assessment is based on the supervisor's observations of the student and on the report submitted by the student.
8. The UT supervisor acts as the examiner for this unit and bases their grade on the assessment made by the company supervisor, the report written by the student and a discussion with the student. The student must submit the report to the UT supervisor within two months after finishing the internship. The internship report is *not* publicly available.

Article A3.10 Duration of the internship

1. According to the study load of 20 EC, the duration of an internship is the equivalent of 14 weeks of full-time work including writing a report. An extension with two weeks of this period is allowed to compensate for unforeseen delays.
2. If the host organisation and the student want to maintain a working relation after this period, the student must complete the internship first. After completion of the internship, the working relation between the student and the company falls outside the scope of the student's study programme and outside the responsibility of the University of Twente.

Article A3.11 Confidentiality

1. The final-thesis report is made public unless confidentiality has been deemed necessary.
2. The Programme director may declare a final thesis report to be confidential for a limited period upon receiving a motivated request to do so.
 - a. A confidentiality request must be made by the examiner as soon as possible, but no later than four weeks before the end of the final project.
 - b. A confidential report remains accessible to the supervisor, the Programme director, and any members of bodies with the authority to assess the quality of the grading of the entire programme.

- c. All parties mentioned in Paragraph 2b are required to respect the confidentiality of the report.
3. The confidentiality period is by default set at 2 years up to a maximum of 5 years.
4. If confidentiality is deemed necessary as described in Paragraph 2, the contents of the public final thesis presentation may be adapted to avoid making public those matters that are considered confidential.
5. Section B of these Education and Examination Regulations may include additional provisions.

Article A3.12 Evaluation

1. The Programme director is responsible for monitoring the quality of the educational programme.
2. The Programme director is responsible for evaluating the programme.
3. To monitor and to improve the quality of teaching, the EEMCS MSc programmes use information about the students' learning experiences obtained from:
 - Internal evaluations
 - Periodic course evaluations at the end of each course
 - Additional (panel) evaluations, on request from lecturer, students, Programme committee, Examination Board or Programme Director
 - External sources
 - National Student Survey (NSE)
 - National Alumni Survey
 - International Student Barometer
4. Section B can include further details on how the education in the programme is evaluated.

A4 Teaching and assessment

Article A4.1 Examinations

1. Each study unit concludes with an examination.
2. The examination consists of one or more tests.
3. A test or examination can have various forms⁵ and can be administered online or offline.
4. The time allotted to administering a test may not exceed three hours. Exceptions in this regard are listed in Article 7.2.
5. If the examiner wishes to use a form of assessment that requires more than three hours, the examiner must, with due regard for Article 4.2.3, ask the examination board for approval to deviate from the above.
6. A student has the right to inspect recent model test questions, model tests, or old tests that are representative of the test or examination, as well as the associated answer keys, along with the norm for assessment and time estimated for answering the example test.
7. If an examination or test is administered online using *online surveillance*⁶ or *online proctoring*⁷, the Examination Board may set further rules and conditions for online (*proctored*) assessment.

⁵ A test or exam can have the following forms: a written test, an assignment, an oral test, a presentation, practical assignment, or a combination of these forms.

⁶ Camera surveillance of the student or students during an *unrecorded* test, using for example Canvas, Teams, etc.

⁷ Surveillance of the student or students using special *proctoring* software, such as Proctorio.

General information and detailed rules on online assessment is presented at the university's [website](#).

Article A4.2 Course Catalogue and Assessment Schedule

1. The Programme director publishes at least the following details of the study units in SIS not less than four weeks in advance: scope, intended learning outcomes and content, language of tuition and assessment, prerequisites, required and recommended study materials, design of teaching methods, and assessment.
2. The assessment schedule of a study unit is drawn up by the examiner or examiners and is determined by the Programme director. The Examination Board provides advice on the assessment schedule.
3. At least two weeks prior to the start of the study unit an assessment schedule must be published in the Learning Management System (LMS).
4. The assessment schedule includes at least all items as included in the course catalogue yet shall also include:
 - a. The intended learning outcomes of the study unit and how they are assessed and when they are attained.
 - b. when examinations, tests, and resits are held (the precise times and dates are announced via the timetable).
 - c. the relative weighting of the tests.
 - d. any required minimum grade per test; a minimum grade for a test may not be set higher than 5.5.
 - e. if applicable: information on resits (such as conditions, compensation options and grading periods).
5. The Programme director may modify the assessment schedule during the study unit:
 - a. The assessment schedule may only be changed in consultation with the examiners of the study unit.
 - b. The Programme director consults the Examination Board before any changes to the form or manner of administering an examination or one or more tests. If the change only involves moving tests to a timeslot other than as shown in the timetable, the Programme director informs the Examination Board of the decision as soon as possible.
 - c. Students must be informed immediately of the change.
6. Changes to the assessment schedule may not put students at an unreasonable disadvantage. The Examination Board may take special measures in individual cases.

Article A4.3 Examination and test opportunities

1. There will be an opportunity to take written or oral tests at least twice a year. Other forms of examination can be completed at least once a year.
2. In the event that a study unit is discontinued, at least one opportunity is provided in the year subsequent to discontinuation to take the examination or parts thereof, and a transitional arrangement must be included in Section B for the subsequent period.
3. At the student's request, the Examination Board may permit a different form of examination than that stipulated in the course catalogue. The examiner may ask the Examination Board to permit a different form of examination on condition that all students participating in the test agree.

Article A4.4 Registering for courses, tests and examinations

1. Registration in SIS is required prior to participating in a course⁸. It is also mandatory to register before every test opportunity.
2. Notwithstanding Paragraph 1, any student who has correctly registered to participate in the instruction/classes for a particular course and has been admitted will also automatically be registered for the subsequent tests, unless the course description specifies otherwise. Only if a student has passed a test and the student still wants to take part in the subsequent test, the student has to register in SIS manually prior to the test opportunity.
3. Before the start of a study unit, the student must meet the prior knowledge prerequisites for that study unit
4. With respect to possible prior knowledge requirements of subsequent study units a student is allowed to assume that they passed an examination at the examination date, as long as the result of the examination is pending.
5. Notwithstanding Paragraph 4, if the pending result turns out to be a fail and because of that the student violates the prior knowledge requirements of a subsequent unit, the Examination Board can decide that the student must interrupt their participation in this subsequent unit pending a repair of the fail.

Article A4.5 Examination date

1. The examination date of a study unit, mentioned in the SIS, is the date on which the student fulfilled the last obligation, necessary for an assessment of the unit.
2. If a student agrees with an examiner about an examination date for a certain unit, the submission of additional material by the student after this date leads to a new examination date, being the date of the submission of this additional material.

Article A4.6 Oral tests

1. If the student or the examiner wishes a third party to be present when administering an oral test, then a request to this end must be submitted to the Programme director at least fifteen working days prior to the oral test. The student and the examiner are notified of the Programme director's decision not less than five working days in advance. The Programme director must inform the Examination Board of the decision. Public graduation colloquia, public presentations and group tests are excluded from this provision.
2. If the Examination Board has decided that members of the Examination Board or an observer on behalf of the Examination Board is to be present during the administration of an oral test, then the Examination Board must make this known to the examiner and the student at least one working day before the oral test.

Article A4.7 Examination results

1. The examination result of a study unit, as determined by the examiner, is expressed in half grades from 1.0 to 5.0 and from 6.0 to 10.0⁹ or as 'pass' / 'fail'. With grades only being rounded in the final phase¹⁰ of the assessment of a study unit and in accordance with the schedule

⁸ The applicable registration deadlines are mentioned on the webpage www.utwente.nl/en/education/student-services/education/courses-and-modules/.

⁹ In SIS, a comma is used based on the Dutch grading system (e.g., 7.0).

¹⁰ Final phase: the calculation of the examination result after all test results have been announced.

below:

If digit before the decimal (n) ≠ 5	
Grade $\geq n.00$ and $< n.25$	$\Rightarrow n.0$
Grade $\geq n.25$ and $< n.75$	$\Rightarrow n.5$
Grade $\geq n.75$ and $< (n+1).00$	$\Rightarrow (n+1).0$
If digit before the decimal = 5:	
Grade ≥ 5.00 and < 5.50	$\Rightarrow 5.0$
Grade ≥ 5.50 and < 6.00	$\Rightarrow 6.0$

2. Test results are expressed in a grade from 1 to 10 with a single decimal, or as 'pass' / 'fail'.
3. Examination results of 6.0 or higher respectively 'pass' are a pass.
4. Examination results, if a pass, obtained at foreign universities are registered as a P (pass). Examination results obtained at Dutch universities are adopted one-to-one, with due regard for the provisions in Paragraph 1.
5. Credits may only be issued for a study unit if the study unit has been completed with a pass mark.
6. If more than one examination or test result has been recorded in SIS for one and the same unit of study, the highest grade applies.

Article A4.8 Determining and announcing results

1. The result of a written test or practical assignment is published via SIS within 20 working days.
 - a. The examiner determines the result of a written test within 15 working days after the test.
 - b. The examiner needs to pass on the result to the examination office or process the results in SIS within 5 working days of determining the result.
 - c. No rights can be derived from test results published on the LMS or communicated via any medium other than SIS.
2. The examiner has to inform the student of the result of an oral examination within one working day, unless, for the examiner, the oral examination is part of a series of oral examinations of the same study unit which are administered on more than one working day. In that case, the examiner is to determine and announce the result within one working day following the conclusion of the series of oral examinations.
3. In case the result for a study unit is based on multiple tests, the date of completion of the final test counts as the examination date.
4. In case the examiner is unable to meet the terms described in Paragraphs 1 and 2 due to extraordinary circumstances, they must inform the Examination Board of this, providing reasons for this situation. The student is then informed of the delay by the Examination Board as soon as possible, whereby a new deadline for the result is also determined. If the Examination Board concludes that the examiner has not met their obligations, it may appoint another examiner to ascertain the result of the examination.
5. Notwithstanding Paragraph 1, the results of the first test have to be published at least five working days before the resit to give the student time to prepare.

Article A4.9 Period of validity

1. The period of validity for the results of an examination that has been passed is unlimited. The validity of an examination result can only be restricted if the tested knowledge, insight, or skills are proven to be out of date. The Examination Board ensures that these results are invalidated.
2. Test results are only valid in the academic year in which they were obtained unless they are aggregated into an examination result or the assessment schedule explicitly states otherwise.
3. The Examination Board may extend the validity of test results in individual cases at the request of the student.

Article A4.10 Post-examination right of inspection and discussion

1. Students are entitled to discuss and review their test together with the examiner, and the examiner has to explain the assessment. This can be done individually or in a group setting, either in person or by using an online tool. The examiner chooses the setting of methods and tools for discussion.
2. Individual and group discussions must take place no later than five weeks after the publication of the test results, but at least five working days prior to the next test opportunity, in the (online) presence of the examiner or a substitute designated for that purpose.
3. If the examiner holds a group discussion of the assessment, the student must use that opportunity to exercise the right to discussion referred to in Paragraph 1. If a student is not given the opportunity at the group discussion to discuss the reasons for the examiner's assessment of the test with the examiner, the student may submit a request for individual discussion with the examiner within five working days after the group discussion. The individual discussion has to take place no later than five working days prior to the next test opportunity.
4. If there is no group discussion of the test scheduled by the day of the publication of the results, then a student may submit a request to the examiner for an individual discussion within ten days after publication of the results. The individual discussion has to take place no later than five working days prior to the next test opportunity.
5. The student has the right to inspect their work for a period of two years after the assessment.

Article A4.11 Retention period for tests

1. The retention period for test assignments, keys, papers, and the assessments of written tests is two years.
2. The retention period for final thesis reports is seven years.

A5 Final Examination

Article A5.1 Master's final examination and degree

1. The Master's final examination is considered to be complete when the student has passed all study unit examinations in the Master's programme. The examination board may find, under conditions that it has set, that not every examination has to be passed to determine that the master's final examination has been successfully completed (Article 7.12b paragraph 3 WHW).
2. The date of the final examination is the date on which the student completes the final study unit of the degree programme.
3. A diploma can only be awarded after the student has received formal approval for their study programme as described in Section B.

4. A student may submit a written request, giving reasons, to the Examination Board to postpone the final examination, and thus to postpone the awarding of the diploma. The maximum duration of any postponement that can be granted is twelve months, in principle. In exceptional cases¹¹, the student may have valid reasons for requesting that the awarding of the diploma be postponed for more than twelve months.
5. If the student has requested postponement based on the provisions of Paragraph 4, then the date of the examination is the date on which the Examination Board decides that the student has passed the final examination subsequent to the postponement.
6. Students who have successfully met all requirements for the Master's final examination are awarded a Master of Science (MSc) degree.
7. The degree conferred is stated on the diploma.

Article A5.2 Diploma

1. The Examination Board awards a diploma as proof that the student has satisfied all the requirements of the examination once the Executive Board has confirmed that the procedural requirements for awarding the diploma have been met. The date indicated on the diploma (i.e., the date of the final examination) is the date on which the student completed the final study unit of the degree programme.
2. The diploma is signed by the chair of the Examination Board. If the Chair is absent, one of the members of the Examination Board may also sign the diploma.
3. The diploma is in English and complies with the European format for such diplomas and WHW Article 7.11.
4. An International Diploma Supplement is appended to the diploma. This supplement is intended to provide insight into the nature and content of the degree programme to promote the international recognition of the programme (WHW, Article 7.11, Paragraph 4).
5. If the Examination Board has awarded a specific distinction (e.g., cum laude) to the student, then this is mentioned on the diploma.
6. Students who have successfully completed more than one examination but cannot be awarded a diploma as referred to in Paragraph 1, receive, at their own request, from the Student Services Desk a statement prepared by or on behalf of the Examination Board which in any case states the results of the examinations the student has passed.

Article A5.3 Cum Laude

1. The Examination Board checks whether the student has fulfilled all requirements. If the *judicium Cum Laude* ('with distinction') applies, this is stated on the diploma and the diploma supplement.
2. The *judicium Cum Laude* can be awarded provided the following requirements are met:
 - a. The precise weighted average¹² of the grades for all study units of the Master's examination programme, excluding the Master's thesis (final project) and the internship (if applicable), is at least 8.00; Results for study units outside the examination programme, are not taken into account.

¹¹ Some examples (by way of illustration, not to exclude other situations): the student attends a double degree or combined degree programme, or an extensive extra-curricular activity requires more than twelve months.

¹² The weighted average is proportional to the number of credits.

- b. Those parts of the examination programme for which an exemption was granted, or which were not graded with a number¹³ are not considered when calculating the average grade.
 - c. Exemptions within the examination programme may be granted to a maximum of 15 ECs.
 - d. The study unit of the Master's thesis (final project) is graded at 9.0 or higher.
 - e. If an internship is part of the examination programme, it is graded at 8.0 or higher.
 - f. No more than one study unit of the examination programme has been graded lower than 7.0.
 - g. The study programme has been completed within 125% of the nominal duration, starting from the start date recorded in SIS.
3. Students who have been found guilty of academic misconduct in academic activities related to the programme for which the cum laude is to be awarded, are excluded from the *judicium cum laude*.
 4. In individual cases the Examination Board may grant the *judicium Cum Laude* even if not all requirements are met due to extenuating circumstances. It is noted that the distinction of cum laude is never awarded automatically, but only following individual assessment of the student's academic achievements.

A6 Student guidance and study progress

Article A6.1 Study progress report

1. Every student can access their list of the results achieved in SIS. The student can request a certified study progress overview from the Student Services Desk if required.

Article A6.2 Student guidance

1. The Faculty Board is responsible for student guidance.
2. Student support and guidance includes 'decentralised' guidance, as provided within study programmes, and 'central' guidance, as provided by the Centre for Educational Support.
3. Student guidance includes guidance with questions or problems with regard to career orientation and career choices and guidance with problems that affect study progress. Students are offered personal and professional student (career) guidance for optimal study progress. Where possible, needs for specific guidance are met.
4. Each student is assigned a study adviser.
5. The study adviser supervises students and advises them on all aspects of the studies, also on personal circumstances that may be affecting the student's studies.
6. A systematic method on how students are monitored and obstruction in study progress is signalled is documented by the programme (for example in a policy plan or an annual cycle).
7. Information about the guidance facilities of the study programme is in any case available on the website of the study programme.

¹³ With the exception of EIT Digital Master school programmes

Article A6.3 Special Facilities

1. If students wish to exercise their right to specific supervision or special facilities, they should contact the study adviser. The study adviser records the agreements made with the student in SIS.
2. A student is entitled to special facilities in case of demonstrable circumstances beyond the student's control or extenuating personal circumstances. The facility may provide for dispensation from or an additional opportunity to sit examinations or tests to be granted and/or for specific facilities to be made available. Such dispensation and additional resits may only be granted by the Examination Board.

A7 Studying with a functional impairment

Article A7.1 Studying with a functional impairment

1. A functional impairment is defined as having an illness condition, impairment, or handicap that might impede or otherwise constitute a barrier to the student's academic progress.
2. Facilities are aimed at removing individual barriers in attending the degree programme and/or when it comes to taking examinations and tests. These facilities may be related to access to infrastructure (buildings, classrooms, and teaching facilities) and study materials, adjustments to the form of assessment, alternative learning pathways, or a customised study plan.

Article A7.2 Request for facilities

1. The study adviser and the student concerned discuss the most effective facilities that can be provided for the student as referred to in Article 2 of the Equal Treatment of Disabled and Chronically Ill People Act (WGB h/cz).
2. Based on the discussion referred to in Paragraph 1, the student has to submit a request for facilities. This request should be submitted to the study adviser, who has been mandated by the Faculty Board, preferably three months before the student participates in classes, exams, and tests for which the facilities are required.
3. The request should be supported by documents that are needed to enable an assessment to be made.
4. The study adviser decides on the admissibility of the request and informs the student of the decision within twenty working days after receipt of the request, or sooner if the urgency of the request dictates.
 - a. Should the request be granted, the period of validity is also indicated.
 - b. If the request is not granted, or only partly granted, the study adviser informs the student of the justification for not granting the request as well as the possibilities for filing an objection and an appeal with the Complaints Desk.
 - c. Students who are dyslexic, are granted a maximum of 15 extra minutes for each hour that a test or exam is officially scheduled.
5. The study adviser informs the relevant parties in due time about the facilities that have been granted.
6. The applicant and the study adviser evaluate the facilities before the end of the period for which they have been granted. During this evaluation, the parties discuss the effectiveness of the

facilities provided and whether they should be continued. No evaluation takes place of facilities granted to students because of the functional impairment dyslexia.

A8 Amendments, transitional arrangements, appeals and objections.

Article A8.1 Conflicts with the regulations

If other additional regulations and/or provisions pertaining to education and/or examinations conflict with these Education and Examination Regulations, the provisions in these Education and Examination Regulations prevail.

Article A8.2 Administrative errors

If, following the publication of a result, a marks sheet, or a student's progress report a manifest 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 in rectifying the error.

Article A8.3 Amendments to the regulations

1. Substantive amendments to these Education and Examination Regulations are enacted by the Faculty Board in a separate decision.
2. In principle, substantive amendments to these Regulations do not apply to the current academic year. 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 by the Examination Board.

Article A8.4 Transitional arrangements

1. In the case of amendments to the Education and Examination Regulations, the Faculty Board adopts a transitional arrangement, as necessary.
2. The transitional arrangement must be published on the degree programme's website or published in Section B of these regulations.
3. The following principles are applicable to any transitional arrangement if a Master's programme is changed:
 - a. Changes to the curriculum are to be announced prior to the academic year in which the changes take effect.
 - b. No guarantee can be made that all programme study units that were part of the curriculum when students enrolled in a programme continue to be part of the curriculum. The final Master's examination is to be based on the curriculum most recently adopted by the Faculty Board.
4. Transitional arrangements always include:
 - a. which discontinued study units are equivalent to study units or components thereof in the revised Master's programme that is included in Section B.
 - b. if a study unit without practical exercises is discontinued, there will be at least one opportunity in the subsequent academic year to take a written or oral examination or to ensure assessment by some other means.
 - c. if a study unit that involves practical exercises is removed from the programme, and during the subsequent academic year no opportunities are provided to complete these practical exercises, at least one study unit is designated as a suitable replacement for the discontinued study unit.

- d. the term of validity of the transitional arrangement.
5. The transitional arrangement must be approved by the Examination Board.
6. In exceptional cases and to the student's benefit, the Examination Board may deviate from the prescribed number of opportunities to sit exams and/or tests related to study units that have been dropped from the curriculum.

Article A8.5 Assessment of the Education and Examination Regulations

1. The Faculty Board is responsible for the regular assessment of the Education and Examination Regulations, with specific emphasis on the study load.
2. In accordance with article 9.18 of the WHW, the programme committee has a partial right of consent of and a partial right to be consulted on parts of the Education and Examination Regulations.
3. The Programme Committee is responsible for the annual assessment of the manner in which the Education and Examination Regulations are implemented.

Article A8.6 Appeal and objections

An appeal and objections must be submitted in writing to the [University of Twente Complaints Desk](#) within six weeks after notification of a decision to the student.

Article A8.7 Hardship clause

In cases of demonstrable unreasonableness and unfairness of a predominant nature, the Examination Board or the Programme Director may allow the provisions in these Regulations to be deviated from. This depends on which body is authorised or has the duty according to these Regulations to take a decision on or make an exception to a provision in these Regulations.

Article A8.8 Publication

The Education and Examination Regulations and the Examination Board's Rules and Guidelines are to be published on the degree programme's website.

Article A8.9 Entry into force

These Regulations enter into force on 1 September 2024 and replace the Regulations dated 1 September 2023.

SECTION B: PROGRAMME-SPECIFIC SECTION EMBEDDED SYSTEMS

About this Section

The Education and Examination Regulations (EER) are subdivided into two sections (Section A and Section B), which together form the EER. Section A, which can be seen as the faculty section, includes provisions that apply to all EEMCS Master's degree programmes. Section B contains the provisions that are specific to the particular degree programmes, in this case the Master's programme Embedded Systems.

B1 General provisions

Article B1.1 Definitions

In addition to definitions in Article A1.2, the following definitions are used in this Section B:

1. Programme mentor: a staff member, who is appointed by the examination board, to supervise students until they start their Master's final project.
2. The individual study programme is the examination programme of a student that is approved according to the rules of the master Embedded Systems.

B2 Programme objectives and final attainment targets

Article B2.1 Aim of the programme

This Master's programme is intended to impart sufficient knowledge, skills and a clear understanding of the area of Embedded Systems in order that the graduate is able to perform independent professional and scientific activities in the area at an academic level.

Article B2.2 Final attainment targets

The graduate

1. has an all-embracing view on embedded systems, their design and their application in systems (e.g. in small robots, cyber-physical and networked systems) including their evolution over time, demonstrated by an integration approach in system design.
2. is able to describe, study and specify the functional aspects of embedded systems taking into account the performance of the system during its lifetime.
3. is able to describe, study and specify the societal aspects of embedded systems, e.g., resource boundedness and dependability. The graduate is also aware of costs and environmental issues making optimal use of the available resources.
4. has a thorough knowledge of state-of-the-art methods and techniques for embedded systems design such as requirements engineering, hardware-software integration, performance modelling and analysis, validation, and testing. Knows how to use these methods and techniques in a structural way using appropriate abstractions.
5. is able to design embedded systems. The designs satisfy functional and non-functional requirements (see ILOs 2 and 3) and state-of-the-art methods and techniques are used (see ILO 4).
6. has basic knowledge of, and (design) skills in the following areas that are relevant to the domain of embedded systems: artificial intelligence, security, Internet-of-Things (IoT). (Besides the basic knowledge in hardware design, software design and system design which are covered by ILOs 1-5.)
7. has the ability and attitude to include other disciplines or involve practitioners of these disciplines in his/her work, where necessary. As an engineer he/she is therefore able to work in a multidisciplinary setting.

8. is able to conduct research and design independently and has a scientific approach to complex problems.
9. possesses intellectual skills that enable him/her to reflect critically, reason, and form opinions.
10. has the ability to communicate the results of his/her learning, thinking, and decision making processes at an international level.
11. is aware of the temporal and social context of science and technology (comprehension and analysis) and can integrate this context in his/her scientific work.

B3 Further admission requirements

Article B3.1 Additional admission requirements

1. Students in possession of a Bachelor degree in Electrical Engineering (*Elektrotechniek*) or Computer Science (*Technische Informatica, Telematica* or *Informatica*) from a Dutch university are eligible for direct admission to the programme.
2. Students in possession of another Bachelor's degree issued by a Dutch university are eligible for admission to the programme if their knowledge and skills are comparable to section 3.1.1 after following a pre-master programme.
3. Students in possession of a relevant Dutch Bachelor's degree issued by a University of Applied Sciences can gain admission after first successfully completing a pre-master programme.

Article B3.2 Pre-Master's programme

For students with an 'HBO degree' *Elektrotechniek* the pre-master programme is:

Course code	Name	EC	Period
202001171	Calculus A	5	Semester 1
202001173	Calculus B	4	Semester 1
202001178	Linear Algebra A	3	Semester 1
202001185	Linear Systems	6	Semester 1
202001183	Algorithms, Datastructures and Complexity for EmSys	4	Semester 1
201500252	Digital Logic and Computer Organization	3	Semester 1
201500051	Self-tuition project (programming)	5	Quarter 1B

For students with an 'HBO degree' (*Technische*) *Informatica*, *Embedded Systems* the pre-master programme is:

Course code	Name	EC	Period
202001171	Calculus A	5	Semester 1
202001173	Calculus B	4	Semester 1
202001178	Linear Algebra A	3	Semester 1
202001185	Linear Systems	6	Semester 1
202001185	Algorithms, Datastructures and Complexity for Emsys	4	Semester 1

201500252	Digital Logic and Computer Organization	3	Semester 1
202300099	Instrumentation for Embedded Systems	5	Quarter 1B

B4 Curriculum structure

Article B4.1 Composition of programme

The 120 EC programme consists of the following components:

- a. compulsory courses
- b. homologation
- c. electives
- d. internship
- e. final project

Article B4.2 Compulsory units of study

The compulsory courses are:

Year 1

Course code	Name	EC	Quarter
192130240	Embedded Computer Architecture 1	5	1A
202200100	Systems Engineering	5	1A
202200159	Embedded AI	5	2A
192130200	Real-time Systems 1	5	2A
201000168	Embedded Systems Laboratory	5	2B
201700083	Security Services for IoT	5	2B

Year 2

Course code	Name	EC
202001434	Internship	20
202300070	Final Project	40

Article B4.3 Homologation

Due to the interdisciplinary character of the Embedded Systems programme, most students will not have all necessary prior knowledge. A maximum of 10 EC may be included in the individual study programme.

1. Students who have completed a Dutch university Bachelor's degree programme in computer science are required to include the following course in the homologation part of the master programme:

Course code	Name	EC
191210001	Instrumentation for Embedded Systems	5

2. Students who have completed a Dutch university Bachelor's degree programme in electrical engineering without equivalent knowledge of programming (ref. 202200108 Software Development for Robotics) and internet/network security (ref. 202300232 Network Systems), are required to include the following courses in the homologation part of the master programme:

Course code	Name	EC
202200108	Software Development for Robotics	5
202300232	Network Systems	5

3. Students with a Bachelor's degree awarded by a University of Applied Sciences are required to include the following course in the homologation part of the master programme:

Course code	Name	EC
201800126	Distributed Energy Management for Smart Grids	5

4. For admitted students not mentioned in paragraph 1, 2 and 3 an individual homologation programme is made by the examination board.

Note: a homologation course can be replaced by an elective course after an approval from the programme mentor.

Article B4.4 Electives

Specialization courses totaling at least 15 EC should be selected. An individual study programme containing courses that are not in the list, e.g. relevant courses from the TU-Delft and TU-Eindhoven, require approval from the examination board. See Article B5 for approval of the Individual Study Programme.

Course code	Name	EC
192135310	Modeling & Analysis of Concurrent Systems	5
191211590	System-on-chip-Design for Embedded Systems	5
201700075	Internet of Things	5
191210750	System-on-chip-Design	10
191211030	Mobile Radio Communications	5
192130112	Distributed Systems	5
191612680	Computer Ethics	5
201100137	Philosophy of engineering: Ethics	2.5
201900007	Perspectives on Engineering Design	2.5
192130250	Embedded Computer Architectures 2	5
201800126	Distributed Energy Management for Smart Grids	5
201500040	Introduction to Biometrics	5
201000231	Computer Arithmetic	5
192130022	Design of Digital Systems	5
191210950	Implementation of Digital Signal Processing	5
191210910	Image Processing and Computer Vision	5
202100244	Pervasive Computing	5
192620010	Mobile and Wireless Networking	5
202200135	Dependable Computing Systems	5
202001472	Software Testing and Risk Assessment	5
191210850	Advanced Analog IC electronics	5

191211090	Real-time software Development	5
192130210	Real-Time Systems 2	5
201700082	Principles of Programming, Processes and Patterns	5
201100254	Advanced Computer Vision & Pattern Recognition	5
201700073	Ad-Hoc Networks	5
191211060	Modern Robotics	5
191210840	A/D Converters	5
201400177	Cloud Networking	5
201600070	Machine Learning 1	5
201600071	Machine Learning 2	5
192140122	System Validation	5
201200006	Quantitative Evaluation of Embedded Systems	5
202200112	AI for Autonomous Robots	5
202100101	Wireless Communication Systems	5
202200105	Robot Perception, Cognition, Navigation	5
202200109	Advanced Software Development for Robotics	5
202200110	Tele-presence Robotics	5

2022Note: Computer Ethics (191612680) can not be taken as a combination with Philosophy of engineering: Ethics (201100137) and Perspectives on Engineering Design (201900007).

Article B4.5 Internship and Multi-Disciplinary Design Project

1. All compulsory courses should be completed and at least 45 EC should be obtained before starting the internship.
2. The students can complete an internship worth 20 EC, or a multi-disciplinary design project (191211650) worth 10 EC, but not both, only after an agreement with the programme mentor. The missing 10 EC should be covered by extra electives.
3. Students with a diploma of a Dutch university of applied sciences are not allowed to do an internship. For these students, the internship is replaced by 4 master courses worth 20 EC in total.

Article B4.6 Final project

1. All compulsory courses shall be finished and no more than 10 EC are open before starting a final project.
2. A student will carry out an embedded systems related final project in a chair of Electrical Engineering or Computer Science.
3. The final project will normally be carried out within the chair, mentioned in paragraph 2. A final project may only be carried out external to one of the chairs with the explicit approval of the intended chairman of the assessment committee.
4. The final project cannot be carried out in the same organization as the internship.
5. The final project (202300070) is 40 EC.
6. At least four weeks before the final audit of the final project, the student should register for the final audit of the embedded systems programme.
7. Before registering, the student will discuss the progress of his master's thesis with the graduation committee. The chair of the graduation committee must co-sign the application form for the final audit. By co-signing the application form, committee entitles the student to give a final presentation and receive a final grade for the final project ("green light" declaration).

8. In case of a negative “green light” declaration, a maximum 3-month extension can be given for a second trial of “green light” meeting.
9. If the final grade is a fail, then the student must carry out a supplement to the project within a period of two months, after which the graduation committee will state its opinion again, which will lead at the most to a 6. In exceptional cases a higher grade is possible. This new final grade will be regarded as the result of a resit. If the result of a resit is a fail, then the student shall have to carry out a new Master's final project.

B5 Study Programme

1. Students must draw up their individual study programme at latest six month after the start of the master’s study and discuss it with the programme mentor. On behalf of the examination board the programme mentor has the right to approve the individual study programme.
2. Each individual amendment to an approved study programme has to be approved by the programme mentor.
3. Each individual amendment to an approved thesis committee must be resubmitted to the examination board for approval.

B6 Degree

Students who have successfully completed their Master's final examination are awarded a Master of Science degree. The degree awarded is stated on the diploma.

B7 Transitional and final provisions

Article B7.1 Transitional provisions

Notwithstanding the current Teaching and Examination Regulations, the following transitional provisions apply for students who started the programme under a previous set of Teaching and Examination Regulations:

- A maximum of 15 EC of homologation may be included in the individual study programme for students that started this master programme prior to September 2018.
- Students that completed the course Energy Efficient Embedded Systems (192130122) cannot take the course Distributed Energy Management for Smart Grids (201800126) in their individual study programme.
- Students who enrolled before September intake 2023 can chose their compulsory courses from either the new curriculum (Article B4.2) or the old curriculum (see table below)

Course code	Name	EC
192130240	Embedded Computer Architecture 1	5
192140122	System Validation	5
201200006	Quantitative Evaluation of Embedded Systems	5
192130200	Real-time Systems	5
201000168	Embedded Systems Laboratory	5

- For students (enrolled before September intake 2023) who finished the core courses from the old curriculum and want to switch to the new curriculum, the courses of System Validation and Quantitative Evaluation of Embedded Systems can be moved to the elective course list.
- From the academic year 2023-2024, the new course code of the Final project 202300070 (40 ECs) replaces the old course codes of the Final project preparation 201600017 (10 ECs) and the Final

project 201900200 (30 ECs). Students who registered and started the final project preparation before the academic year 2023-2024 may continue to follow the old course code of the Final project 201900200 (30 ECs).

Article B7.2 Publication

1. The dean will ensure the appropriate publication of these Regulations and any amendments to them.
2. The Teaching and Examination Regulations will be posted on the faculty website.

Article B7.3 Effective date

These Regulations enter into force with effect from 1 September 2024.