EDUCATION AND EXAMINATION REGULATIONS

MASTER'S DEGREE PROGRAMMES EEMCS

A. FACULTY SECTION
B. PROGRAMME-SPECIFIC SECTION

2022-2023 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 model 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. These Regulations 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, Internet Science and 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. These Regulations consist of a faculty Section (Section A) and a programme-specific Section (Section B). Section A contains general provisions that apply to education and examinations for all the Master's programmes at EEMCS. Section B contains programme-specific provisions. Together, Sections A and B form the Education and Examination Regulations for the relevant programme.
3. The 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.
4. These Regulations apply to anyone enrolled in the Master's programmes, irrespective of the academic year in which the student first enrolled in the programme.
5. Section B of these Education and Examination Regulations may include additional general provisions for the relevant programme.
6. The general provisions and the programme-specific provisions to the Education and Examination Regulations are determined by the Faculty Board.
7. For students attending study units organised by another programme [1] 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.
8. 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.
9. 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).
10. 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. **Admissions 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 Admissions Board has been appointed for the programme, the Programme director will function as the Admissions 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 the programme-specific 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 on the basis of 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 will be 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 exercise:** A practical exercise 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 the programme-specific section.
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 on the role as chair of an assessment committee for the Final Project.
ee. **Student Information System (SIS)**: System designated by the Board of Executives 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.
ii. **Study Programme:** All study units followed by the student as part of their Master's degree programme.
jj. **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).

kk. **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.

ll. **UT:** The University of Twente (UT).

mm. **Working day:** Any day from Monday to Friday with the exception of official holidays and the prearranged compulsory holidays (compulsory days free of work) 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 Admissions Board of the Master's programme will assess the candidate's suitability for admission to the programme on the basis of the requirements stipulated in Section B.
3. The Admissions Board can admit students who lack some prior knowledge, provided they judge that this will 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[2]:
    a. IELTS (academic) with overall band score of at least 6.5 no older than two years
    b. TOEFL internet-based test of at least 90 no older than two years
    c. Cambridge C1 advanced, and C2 proficiency, formerly known as CAE or CPE (both with an A, B, or C grade)
3. The following students are exempt from the requirement to prove their proficiency in English; students who:
    a. have obtained a relevant Bachelor's degree from an accredited academic institution in the Netherlands;
    b. have obtained a three-year Bachelor's degree in one of the following countries: Australia, Canada (English-speaking part), Ireland, New Zealand, UK or USA. When your

[2] Article A2.2 reflects the language requirements for students entering the Master in September 2022-2023. For prospective students, these requirements will likely change to include sub-scores as of 1 October 2022. Check https://www.utwente.nl/en/education/master/admission-requirements/language-requirement/#english-language-requirements for the latest requirements.

awarding institution is in one of these countries, but your teaching institution was not, you are not exempted. The same rule applies to distance (online) education where the awarding institution is in one of the mentioned countries, but the student was not..

c. Depending on the programme, have had English as an exam subject during their secondary education in some predetermined countries (according to the country list).

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 Admissions Board

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

Article A2.5 Admissions procedure

1. The Admissions 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 Admissions 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 Board will also assess requests for admission on the basis of the following documents:
    a. motivation letter;
    b. English proficiency scores according to Art. A2.2;
    c. Diploma;
    d. transcript of records;
    e. curriculum vitae;
    f. abstract of thesis;
    g. course descriptions for programme-specific courses, research methodology courses, mathematics courses and a table of content for the course materials.
4. The Admissions 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 will 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 will be informed of this promptly. The Examination Board or the Faculty Board will 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 Admissions 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 Admissions 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 Admissions 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, will serve 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 follow 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, will serve as proof of admission to the relevant Master's programme.
7. Deviations from these regulations are to be decided upon by the admission board.

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 the programme-specific Section B.

Article A3.2 Programme structure

1. The programme-specific 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 credits which have constituted part of a previously completed Bachelor's degree audit.
3. If students are required to sign up to participate in a particular study unit, this is only possible 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 quarters[3]
5. Master's programmes are taught on a full-time basis.

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 will be 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 30EC.
5. Students may also be exempted from practical exercises if they can demonstrate that a required practical exercise will likely give rise to a personal moral dilemma. In such cases, the Examination Board will determine 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 an flexible-degree programme as referred to in Article 7.3j WHW. The Examination Board assesses whether an 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 ECs 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 Combined programmes

A student can obtain diplomas for two UT Master's programmes on the basis of a combined study programme that satisfies the requirements of each individual programme, including the programme intended learning outcomes.
The following requirements apply to the combined programmes and their composition:

1. The student needs to be admitted and enrolled in both programmes in order to combine two programmes.
2. The student's programme of courses represents an amalgamation of two separate study programmes and satisfies the requirements relating to the programme intended learning

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

outcomes of both corresponding Master's programmes. Depending on the requirements of the two Master's programmes, there are four possibilities:

a. A **combined final project** and **combined internship**, whereby both study programmes also incorporate a **maximum of 20 ECs from common courses**.
b. A **combined final project,** but with a **separate internship or no internship**, whereby both study programmes also incorporate a **maximum of 30 ECs from common courses**.
c. **Two separate final projects**, with a **separate internship or no internship**, whereby both study programmes incorporate a **maximum of 30 ECs from common courses**.
d. 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 will apply

3. The combined programme as described in paragraph 2 includes not only study units that are part of both Master's programmes, but also courses for which an exemption has been granted for one Master's programme on the basis of results achieved as part of the other programme.
4. If a single combined final project is included in and is relevant to both Master's programmes, as referred to in 2a and 2b, the study load of the final project must be at least 100% of the requirement in ECs for the final project of the programme that has the highest number of ECs plus at least 50% of the requirement in ECs for the final project of the other programme.
5. If a single combined internship is included that satisfies the requirements of both programmes as referred to in 2a, the study load of the internship must equal the load of the internship with the highest number of ECs.
6. Approval for the common courses is required from the Examination Boards of both Master's programmes.
7. Students who complete a study programme as described take a combined final examination which they will 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 will decide whether a student will pass the final examination. The Programmes will 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 timetable 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 contains at least two examiners, at least one of which is senior examiner; it is chaired by a senior examiner
2. The examiners must belong to (at least) two different 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 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 ECs 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 ECs of their examination programme;
    b. additional requirements may apply for each programme, which will be stipulated in Section B where applicable.
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 daily 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 daily supervisor.
7. During the internship, the student will write a report about their work. At the end of the internship period, this report will be submitted to the company supervisor. The company supervisor will assess the internship using the relevant assessment form. The assessment will be 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 will base 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 of finishing the internship.

Article A3.10 Duration of the internship

1. According to the study load of 20EC 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 will fall 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 and internship report will be made public unless confidentiality has been deemed necessary.
2. The Programme director may declare an internship report and/or 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 preferably before the start of the final project or internship, but no later than four weeks before the end of the final project or internship.
    b. A confidential report remains accessible for 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 2b are required to respect the confidentiality of the report.
3. The confidentiality period will by default be set at 2 years up to a maximum of 5 years.
4. If confidentiality is deemed necessary as described in 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 for the relevant programme.

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, or Programme Director
    - External sources
        - National Student Survey (NSE)
        - National Alumni Survey
        - International Student Barometer
4. The programme-specific 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. Exams and tests can have the following various forms[4] and can be administered online or offline.
4. A student has the right to inspect recent model test questions or model tests, or old tests and the associated answer keys, along with the standards for assessment.
5. If an examination or test is administered online using *online surveillance*[5] or *online proctoring*[6], the Examination Board may set further rules and conditions for online (*proctored*) assessment. Further information and detailed rules on online assessment can be found on 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, learning objectives 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 learning objectives 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 will be announced via *my-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 will consult 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 will inform the Examination Board of the decision as soon as possible.
    c. Students are to 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 .

[4] A test or exam can have the following forms: a written test, an assignment, an oral test, practical exercises, or a combination of these forms.

[5] Camera surveillance of the student or students during an unrecorded test, using for example Canvas, Teams, etc.

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

Article A4.3 Examination 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 will be provided in the year subsequent to discontinuation to take the examination(s) or parts thereof, and a transitional arrangement will 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 participants agree.

Article A4.4 Registering for courses and examinations

1. Registration in SIS is required prior to participating in a course[7].. It is also mandatory to register before every examination 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 examination, unless the course description specifies otherwise. For each examination after that, the student has to register in SIS manually prior to the examination opportunity.

Article A4.5 Examination date

1. The examination date of a study unit, mentioned in the SIS, is the date upon 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 will lead to a new examination date, being the date of the submission of this additional material.
3. With respect to possible prior knowledge requirements of subsequent study units a student is allowed to assume that the student has passed an examination at the examination date, as long as the result of the examination is pending.
4. If the result of an examination is a fail and if because of this fail a student violates prior knowledge requirements of a subsequent unit in which the students participates, the Examination Board can decide that a student must interrupt this subsequent unit pending a repair of this fail.

Article A4.6 Oral examinations

1. If the student or the examiner wishes a third party to be present when administering an oral examination, then a request to this end must be submitted to the Programme director at least fifteen working days prior to the oral examination. The student and the examiner will be 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 examination, then the Examination Board is to make this known to the examiner and the student at least one working day before the oral examination.

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

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 10.0[8] or as *'pass' / 'fail'.* With grades only being rounded in the final phase[9] of the assessment of a study unit and in accordance with the schedule below:

If figure before the decimal (n) ≠5	
Grade ≥n.00 and <n.25	⇨ n.0
Grade ≥n.25 and <n.75	⇨ n.5
Grade ≥n.75 and <(n+1).00	⇨ (n+1).0
If figure before the decimal =5:	
Grade ≥5.00 and <5.50	⇨ 5.0
Grade ≥5.50 and <6.00	⇨ 6.0

2. Test results are expressed in a grade from 1 to 10 with a single decimal, or as *'pass' / 'fail'*.
3. Exam results of 6.0 or higher are a pass.
4. Examination results, if a pass, obtained at foreign universities will be registered as a P (*pass*). Examination results obtained at Dutch universities will be 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 will apply .

Article A4.8 Determining and announcing results

1. The result of a written examination or practical exercise is published via SIS within 20 working days.
    a. The examiner will determine the result of a written examination within 15 working days after the examination.
    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 examination results published on the LMS or communicated via any medium other than SIS.
2. The examiner is 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 will count 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

[8] In SIS, a comma is used, based on the Dutch grading system (e.g. 7,0).

[9] Final phase: when all grades are known.

possible, whereby a new deadline for the result will also be made known. If the Examination Board is of the opinion that the examiner has not met their obligations, it may appoint another examiner to ascertain the result of the examination.

5. If a test resit is planned shortly after the first test, the results of the first test will 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 exam that has been passed is unlimited. The validity of an exam result can only be restricted if the tested knowledge, insight or skills are proven to be out of date.
2. Test results are only valid in the academic year in which they were obtained unless they are aggregated into an exam result.
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. Student are entitled to discuss and review their test together with the examiner, and the examiner is to explain the assessment
2. 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 is to take place no later than three working days prior to the next test opportunity.
3. If there is no group discussion of the test, 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 is to take place no later than three working days prior to the next test opportunity.
4. 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 a minimum of 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 exams in the Master's programme.
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 cases[10], 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 will be 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 will be awarded a Master of Science (MSc) degree.
7. The degree conferred is stated on the diploma.

Article A5.2 Diploma

1. The Examination Board will award a diploma as proof that the student has satisfied all the requirements of the exam 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 will be 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 will be in English and comply with the European format for such diplomas and WHW Article 7.11.
4. An International Diploma Supplement is to be 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 to be 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, will 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 will state the results of the examinations the student in question 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 will be stated on the diploma and the diploma supplement.
2. The *judicium Cum Laude* can be mentioned on the Master's certificate provided the following requirements are met:
    a. The weighted average[11] 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 8.0;
    b. Those parts of the examination programme for which an exemption was granted or which were not graded with a number are not considered when calculating the average grade;

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

[11] The weighted average is proportional to the number of credits.

c. Exemptions within the examination programme may be granted to a maximum of 15 ECs;
d. 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. In individual cases the Examination Board may grant the judicium Cum Laude even if not all requirements are met.

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 'decentralized' 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.

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 will record 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 to be aimed at removing individual barriers in the teaching 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 will 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 is 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 is to participate 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 will decide on the admissibility of the request and will inform 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 will also be indicated.
    b. If the request is not granted, or only partly granted, the study adviser will inform 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, will be granted a maximum of 15 extra minutes for each hour that a test or exam is officially scheduled.
5. The study adviser shall inform the relevant parties in good time about the facilities that have been granted.
6. The applicant and the study adviser will 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 will 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 will adopt a transitional arrangement, as necessary .
2. The transitional arrangement is to be published on the degree programme's website or published in Section B of these regulations.
3. The following principles will be 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 will 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 will 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 will be 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 2022 and replace the Regulations dated 1 September 2021.

SECTION B - PROGRAMME-SPECIFIC SECTION SYSTEMS & CONTROL

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 Systems & Control.

CONTENTS

B1 General Provisions

Article B1.1 Definitions

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

a. **Programme mentor**: a staff member, who is appointed by the programme board for each specialisation to supervise students who joined the specialisation until they start their graduation project.
b. **Graduation committee**: the committee that supervises the graduation project and will carry out the assessment of the project.

B2 Programme objectives and final attainment targets

Article B2.1 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 Systems & Control discipline.

Article B2.2 About the programme

1. The master's programme in Systems and Control is a 4TU MSc programme. The programme is offered at TU/e (Eindhoven University of Technology), TUD (Delft University of Technology) and UT (University of Twente). The programmes have a similar structure and comparable core programmes. The programmes are not the same, in the sense that the courses and specializations at each university are different.
2. If a student is admitted to the Systems and Control programme at one of the 3 universities, he/she is also admitted to the programme at the other universities.
3. After a student is enrolled in the MSc programme in Systems and Control at one of the 3 universities, he/she will also obtain a secondary enrolment (neveninschrijving) at the 2 other universities.
4. The pre-master's programmes in Systems and Control of the 3 universities are interchangeable, in the sense that a completed pre-master's programme at one of the three universities grants admission to the MSc programme in Systems and Control at each of the three universities.
5. The core programmes of the 3 universities are interchangeable, in the sense that all credits for core courses obtained in the Systems and Control master's programme at one university will be accepted when a student transfers to the MSc programme in Systems and Control at one of the other universities.

Article B2.3 Intended Learning Outcomes

1. Competence in the scientific discipline Systems & Control
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) …apply advanced physics and measurement methods in systems and control.
   b) …design, carry out and evaluate experiments.
   c) …analyse and design high-performance measurement and control systems for a wide variety of processes.
   d) …relate scientific knowledge to dynamical systems considering their interaction with the environment.

2. Competence in doing research
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) … study a topic by critically selecting relevant scientific literature.
   b) … write a scientific report about own research.
   c) … develop technologies to model, identify and control dynamical systems in an interactive, uncertain and noisy environment.
   d) … generate knowledge within the discipline of Systems & Control.

3. Competence in designing
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) … systematically design controllers for complex dynamical systems.
   b) … generate innovative contributions to the discipline of Systems & Control.

4. A scientific approach
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) … integrate knowledge and information to handle complexity at the systems level.
   b) … analyse problems and use modelling, identification, simulation, design and integration towards solutions.
   c) … solve technological problems in a changing environment considering ambiguity, incompleteness and limitations.
   d) … manage own scientific research independently.

5. Basic intellectual skills
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) … analyse and solve technological problems in a systematic way.
   b) … identify and acquire lacking expertise.
   c) … critically reflect on own knowledge, skills and attitude.
   d) … plan and execute research in changing circumstances.
   e) … integrate new knowledge in an R&D project, considering ambiguity, incompleteness and limitations.
   f) … remain professionally competent.

6. Competence in operating and communicating
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) … work both independently and in multidisciplinary teams.
   b) … explain and defend systems and control outcomes to academia and industry, to specialists and laymen.
   c) … present and report in good English.

7. Considering the temporal and social context
   The graduated Master of Systems and Control Engineering is able to a sufficient level to …
   a) … evaluate and assess the technological, ethical and societal impact of own work.
   b) … act responsibly with regard to sustainability, economy and social welfare.

Article B2.4 Specialisations

The following specialisations are offered at the University of Twente:

Specialisation	Participating chairs	Faculty
Robotics and Mechatronics (RM)	Robotics & Mechatronics Applied Mechanics and Data Analysis (AMDA) Precision Engineering	EEMCS ET ET
Control Theory (CT)	Systems Theory, Applied Analysis and Computational Science (SACS)	EEMCS
Biomechatronics (BM)	Biomechanical Engineering Biomechatronics and Rehabilitation Technology Surgical Robotics	ET ET ET
Unmanned Aerial Vehicles (UAV)	Earth Observation Science Robotics & Mechatronics Engineering Fluid Dynamics Industrial Engineering & Business Information Systems (IEBIS)	ITC EEMCS ET BMS

B3 Further admission requirements

See Chapter A2, for general regulations regarding admission and enrolment.

Article B3.1 Programme specific admission requirements

Students in the possession of a diploma which shows that they have passed the final degree audit for one of the bachelor's programmes, mentioned below, obtained at a Dutch Technical University (Delft, Eindhoven, Twente), are eligible for admission. For admission the conditions, mentioned in the table apply.

BSc	University D: Delft E: Eindhoven T: Twente	Without further requirements	After additional programme (max. 30 EC)
Advanced Technology	T		X
Aerospace Engineering	D	X	
Automotive	E	X	
Biomedical Technology	E, T		X
Chemical Science and Engineering	E, T		X
Civil Engineering	D, T		X
Creative Technology	T		X
Electrical Engineering	D, E, T	X	
Industrial Design Engineering	T		X
Mechanical Engineering	D, E, T	X	
Technical Computer Science	D, E, T		X
Applied Physics	D, E, T		X
Applied Mathematics	D, E, T	X	

Article B3.2 Pre-master's programme for students from a Dutch University of Applied Sciences

See Article A2.7, for general regulations regarding pre-master's programmes.

1. Students seeking admission on the basis of a bachelor's degree awarded by a Dutch University of Applied Sciences must complete a pre-master's programme that includes the following subjects:

Code	Course	Study load (EC)
202001171	Calculus A	5
202001178	Linear Algebra	3
201500252	Digital Logic and Computer Organization	3
202001173	Calculus B	4
202001185	Linear Systems	6
202001141	Engineering System Dynamics	5
202000238	Academic Research Skills	4
	Total	**30**

2. The programme assumes a minimal knowledge level VWO-B in mathematics and a VWO-level in English. (VWO being the Dutch preparatory secondary school for the universities).
3. The conditions for admission to the master's programme are as stipulated in Article A2.7.
4. A student from a Dutch University of Applied Sciences, who has completed the pre-master's programme, mentioned in paragraph 1, as a part of a suitable bachelor's programme, will be admitted directly to the Systems & Control master's programme after successful completion of this bachelor's programme.

B4 Curriculum structure

Article B4.1 Composition of the programme

The curriculum consists of the following elements:

Year	EC	Topic
First	30	Core programme
	30	Specialisation-linked and elective subjects
Second	20	Internship
	40	Graduation project

Article B4.2 Core programme

The core programme has a study load of 30EC according to the following rules:

1. Students must complete the courses on the table below, totalling 25EC.

Code	Course	Study load (EC)
202200104	Control System Design for Robotics	5
201900007	Perspectives on Engineering Design	2,5
201100137	Philosophy of Engineering: Ethics	2,5
202200111	System Identification with Parameter Estimation and Machine Learning	5
One of two courses (to be chosen by the student):		
191211110	Modelling and Simulation	5
202200101	Modelling, Dynamics, and Kinematics	
200900012	Integration project	5

2. In addition, students must complete one course in the field of control to be chosen from the following courses:

Code	Course	Study load (EC)
191561620	Optimal Control	5
191560671	Robust Control	5
201900085	Nonlinear Control	5
191561560	Systems and Control[1,2)]	6
202000256	Learning and adaptive control	5
191150480	Human movement control	5
201700173	Control for UAVs	5

1) Course of the mastermath Network Utrecht
2) In case this course is chosen, the core programme will contain 31EC.

Article B4.3 Specialisation-linked subjects

Subjects are selected by the programme mentor from the course list as described in Article B4.4, after consultation with the student. Subjects taught in the Systems & Control programmes at the technical Universities of Eindhoven and Delft are eligible to be included as a specialisation-linked subject.

Article B4.4 Electives

The number of credits obtained in specialisation-linked subjects, as explained in Article B4.3, is complemented to a total of 30 credits with elective subjects. Available courses at the University of Twente are listed in the table below. It is also allowed to choose subjects taught in the Systems & Control programmes at the technical Universities of Eindhoven and Delft. Lists of available courses at these universities are maintained in their Implementation Regulations and are made public at their website. The total course programme of 60 credits must be approved by the Examination Board.

Courses, not on one of the course lists, can be chosen but should be explicitly approved by the Examination Board. Some of the courses may have an overlapping content, which may be a reason that they cannot be chosen in the same course list**.

List of available specialisation-linked and elective subjects

Course code	Course name	EC	RM	CT	BM	UAV	Quarter
191157750	Engineering Acoustics	5				x	1A
202200103	Image Processing and Computer Vision	5	x			x	1A
201600070	Machine Learning I	5	x	x	x	x	1A
191210930	Measurement Systems for Mechatronics	5	x		x		1A
202200101	Modelling, Dynamics & Kinematics	5	x			x	1A
191561560	Systems and Control*)	6		x			1A
202200100	Systems Engineering	5	x				1A
201400427	Transducer Science	5	x		x	x	1A
201700171	Aerodynamics and Flight Dynamics	5	x			x	1B
201800177	Deep Learning - From Theory to Practice	5	x	x	x	x	1B
201500009	Electric Vehicle System Design	5	x		x	x	1B
201900037	Flexible Multibody Dynamics	5	x		x	x	1B
201900120	Learning and adaptive control	5	x	x			1B

201600071	Machine Learning II	5	x	x	x	x	1B
191561620	Optimal Control	5	x	x			1B
202200105	Robot Perception, Cognition, and Navigation	5	x			x	1B
201300004	Robotics for Medical Applications	5			x		1B
202200109	Advanced Software Development for Robotics	5	x			x	2A
202200107	Design Principles for Robotic and Mechatronic Mechanisms	5	x				2A
191150480	Human movement control	5			x		2A
201900097	Machine learning in engineering	5	x	x	x	x	2A
201900085	Nonlinear Control	5	x	x	x	x	2A
202200106	Optimal Estimation for Dynamic Systems	5	x		x	x	2A
201200135	Random Signals and Filtering	5	x		x		2A
201700168	Regulating robotics and drones	2,5	x			x	2A
191560671	Robust Control	5	x	x	x		2A
202200108	Software Development for Robotics	5	x		x	x	2A
202200110	Tele-presence in Robotics	5	x		x	x	2A
202200112	AI for Autonomous Robots: deep learning and reinforcement learning	5	x		x	x	2B
201700170	Airborne Laser Scanning	5	x			x	2B
201200133	Biomechatronics	5			x		2B
201700173	Control for UAVs	5	x			x	2B
201000168	Embedded Systems Laboratory	5	x			x	2B
201700071	Identification of Human Physiological Systems	5			x		2B
202000040	Introduction to Robotics Design	5	x		x	x	2B
191571090	Time Series Analysis	5		x			2B

*) Course of the Mastermath Network Utrecht

**The following combinations are not allowed due to considerable overlap in learning objectives:

1. The combination of:
   - 201600070 Machine Learning I
   - 202200112 AI for Autonomous Robots: deep learning and reinforcement learning
   - 201900097 Machine learning in engineering

   Systems and Control students are allowed take either of these courses, but not combine them.

2. Any of the combinations:
   - 202200104 Control System Design for Robotics
   - 201900089 Control for (B)ME
   - 202000255 Advanced Control Engineering
   - 191561560 Systems and Control

   Control System Design for Robotics is compulsory, which means that Systems and Control students cannot take the other courses unless specifically requested and approved by the Examination Board.

3. The combination of:
   - 191571090 Time Series Analysis
   - 202200111 System Identification with Parameter Estimation and Machine Learning

   System Identification with Parameter Estimation and Machine Learning is compulsory, which means that Systems and Control students cannot take *Time Series Analysis* unless specifically requested and approved by the Examination Board.

Article B4.5 Homologation courses

The rules for homologation courses are stipulated in Article A2.5, paragraph 3.

Article B4.6 Internship

The general regulations for the internship are stipulated in Article A3.9.

1. Requirements for starting the internship
   a. students must have submitted a study programme to the educational office which was approved by their programme mentor.
   b. students must already have obtained at least 45 ECs of their examination programme, as mentioned in the study programme.
   c. students must have completed the courses of the core programme.
2. The Examination Board 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 such a project is 10EC. The remaining 10EC of the internship will be spent to elective courses. This decision can be taken if the student acquired substantial working experience from one or more internships prior to the Systems & Control master's programme and the student lacks project experience in a research group.
3. In case the internship is replaced by an individual research project, the requirements from paragraph 1 apply for starting the project.
4. Students having a bachelor's degree awarded by a Dutch University of Applied Sciences will carry out an individual research project according to paragraph 2.

Article B4.7 Graduation project

The general regulations for the graduation project are stipulated in Article A3.7. The composition of the graduation committee is stipulated in Article A3.8.

1. A student will carry out the graduation project subject to the accountability of one of the chairs participating in the student's specialisation.
2. A description of the graduation project that a student will do must have been drawn up and approved by a member of the graduation committee.
3. The graduation project shall take place according to a planning as stipulated in Article A3.7. This planning must satisfy the following requirements:
   a. According to the study load of 40EC, 28 weeks of full-time work (40 hours each) are available.
   b. To cope with unforeseen delays, four additional weeks may be added to this period.
4. The graduation project will normally be carried out within the chair, mentioned in paragraph 1. A graduation project may only be carried out external to one of the chairs of the Systems & Control discipline, subject to the explicit accountability of one of the chairs of the Systems & Control

discipline. The chair concerned carries out the supervision as described in the paragraphs of this Article and in Article A3.7 and A3.8. The programme board regards the project as being carried out in the chair concerned. If a project is carried out external to the chair, this should be reported in advance to the examination board.

5. It is possible that students carry out their graduation project in one of the chairs at the Technical University of Delft or the Technical University of Eindhoven, participating in the 4TU Systems & Control programme. The following rules apply for this situation:
    a. The concerned chair must express its willingness to be accountable for the scientific quality of the project.
    b. The concerned chair will form a graduation committee according to the rules in paragraph 3 and 4.
    c. One of the members of the graduation committee must be an examiner from the University of Twente.
    d. The examination board must give explicit consent for this graduation project.
    e. The examination board decides if the graduation project fits the specialisation of the student. If not, the student will have to apply for a Flexible Degree Programme.

Article B4.8 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 online study prospectus. The student should take them into account when planning the study programme.
2. See Article B4.6, paragraph 1 for the requirements to start an internship.
3. Conditions for starting the graduation project are stipulated in Article A3.7, paragraph 1.
4. If in the student's study programme, the internship has been replaced by an individual project, the graduation project can only be started after completion of this individual project.

Article B4.9 Changes in the course programme, compared with the academic year 2021-2022

Because of the start of the new Robotics master's programme in September 2022, a number of courses have been changed that are also attended by students in Systems & Control. See Article B5.1.4 for a possible transfer to the Robotics programme. See Article B7.1 for regulations for students in the Systems & Control programme, regarding the transfer from old to new courses

B5 Planning, procedures and guidance during the master's study

Article B5.1 Specialisation and subject combination

1. Before starting the master's study, students choose one of the specialisations of the programme. The student determines his study programme, together with the programme mentor of the chosen specialisation, and draws up a schedule for attending the subjects, and for carrying out the internship and the final project.
2. The study programme should be approved by the programme mentor and then submitted to the registry of the examination board, at the latest by three months after the start of the master's study.
3. An alteration in the study programme may only be made with the programme mentor's agreement. If the study programme has already been submitted to the registry of the examination board, then any alterations should be reported to the registry immediately.
4. In September 2022, a new master's programme Robotics will be started. Students of the Systems & Control programme will be offered the opportunity to transfer to the Robotics programme, provided

that their study programme satisfies the requirements of the Robotics programme. As long as students are studying in the Systems and Control Programme their study programme should also satisfy the requirements of the Systems & Control programme, as described in paragraphs 1 to 3. A procedure for the approval of a study programme for the Robotics programme will be arranged by the Robotics programme board.

Article B5.2 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 grade 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 B5.3 Internship

The rules for the internship are stipulated in Article A3.9.

1. The examiner of the internship must underpin his/her assessment by filling in the assessment form for the internship, which is made public on the programme's information website (https://www.utwente.nl/en/sc/Procedures%20and%20Forms/rules_documents).

Article B5.4 Graduation project

See Article A3.7 and Article B4.7 for regulations regarding the start and the planning procedure of the graduation project.

1. Not later than four weeks before the planned graduation date the student should register for the final audit of the Systems & Control programme.
2. Before registering, the student will discuss the progress of his graduation project with the graduation committee. The chair of the graduation committee must co-sign the application form for the final audit. With this sign the graduation committee entitles the student to give a final presentation and receive a final grade for the graduation project (green light declaration).
3. The student must hand over the final version of the project report to the committee not later than two weeks before the planned graduation date. The student and the committee are allowed to agree upon a different point of time for the delivery of the report.
4. If the final grade for the graduation project is a failure, 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.
5. This new final grade will be regarded as the result of a resit.
6. If the final grade of a resit is a failure, then the student shall have to carry out a new master's project.
7. The graduation committee of the graduation project must underpin its assessment by filling in the assessment form for the graduation project, which is made public on the programme's information website (https://www.utwente.nl/en/sc/Procedures%20and%20Forms/rules_documents/).

8. If the student cannot complete the graduation project within the period according to the plan as mentioned in Article A3.7 and Article B4.7 for reasons of force majeure, the examination board will allow an extension of this period, compensating for the time loss the student suffered. To obtain an extension, the student must submit a request to the examination board. If this extension is granted, the plan for the graduation project will be adapted according to this extension.
9. If no extension can be given in the situation, mentioned in paragraph 7, the arrangement of paragraphs 3 to 5 will be applied.

Article B5.5 Study counselling

Regulations for study counselling are stipulated in Chapter A6.

B6 Special opportunities

Article B6.1 Extended examinations.

1. On request a student can be given an extended audit by the Examination Board about courses not part of this or another programme, but which could have been part of this programme and for which the student has successfully taken interim examinations. The examinations for these courses may have taken place before or after the final degree audit.
2. As proof that the extended examination has been completed successfully, the examination board can, upon request, issue a separate statement.

Article B6.2 Flexible Degree programmes

Regulations for a flexible degree programme are stipulated in Article A3.5

1. The flexible degree programme shall include at least one unit comparable with the Graduation project of the Systems & Control master's study; this unit shall have a workload of no less than 30 EC and no more than 50 EC.
2. A Flexible Degree programme that can be regarded as belonging to the Systems & Control programme master's programme contains a substantial number, in the order of 20%, of the subjects for this programme.
3. 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.
4. In case of a Flexible Degree Programme the planning, procedures and guidance during the master's study deviate from the setup in Article B5.1.
    a. A (provisional) description of the graduation project should be part of the programme proposal.
    b. The chair accountable for the graduation project and the chairperson of the graduation committee of the graduation project should be known.
    c. This chairperson should approve the study programme and the description of the graduation project and confirm that the study programme forms a suitable preparation of the graduation project.
    d. If the accountable chair does not participate in the Systems & Control master's programme (see Article B2.4) then a full or associate professor from one of the participating chairs mentioned in Article B2.4 must be a member of the graduation committee. He/she must co-approve the items in paragraph c.

Article B6.3 Double/combined programme

Regulations for a double/combined programme are stipulated in Article A3.6.

1. On behalf of the Systems & Control programme a senior examiner from a group participating in the student's specialisation must be a member of the common graduation committee. This senior examiner will carry out the duties for the S&C programme, normally dedicated to the chair of the graduation committee.

B7 Transitional arrangements

Article B7.1 Changes in some courses compared with the year 2021/2022

Because of the start of the Robotics master's programme, some courses have been adapted, resulting in new names and course codes. In the table below, the transition from old courses to new courses is indicated.

Old course code	**Old course name**	**New course code**	**New course name**
191131700	System identification and parameter estimation	202200111	System Identification with Parameter Estimation and Machine Learning
201900093	Control System Design for Mechatronics	202200104	Control System Design for Robotics
191211080	Systems Engineering	202200100	Systems Engineering
191210910	Image Processing and Computer Vision	202200103	Image Processing and Computer Vision
191211060	Modern Robotics	202200101	Modelling, Dynamics & Kinematics
201700167	Positioning and imaging technology	202200105	Robot Perception, Cognition, and Navigation
191210920	Optimal Estimation in Dynamic Systems	202200106	Optimal Estimation for Dynamic Systems
191211090	Real-Time Software Development	202200109	Advanced Software Development for Robotics
191131360	Design Principles for precision mechanisms	202200107	Design Principles for Robotic and Mechatronic Mechanisms
201800335	Programming 2 for BME	202200108	Software Development for Robotics
201800225	Tele-interaction in Robotics	202200110	Tele-presence in Robotics
201700169	2D and 3D scene analysis	202200112	AI for Autonomous Robots: deep learning and reinforcement learning

From the academic year 2022/2023, the old courses will be discontinued. Regarding the transition from the old courses to the new ones, the rules mentioned in the articles below apply.

1. In the course programme of S&C-students, each old course will be considered equivalent to its new counterpart and vice versa.
2. Regarding the compulsory courses (first two courses), students must include either the old course or its new counterpart in their course programme. Including both the old course and the new course is not allowed

3. Regarding the elective courses, students are only allowed to include an old course or its new counterpart, not both.
4. For each old course (that will be discontinued), at least one exam opportunity will be offered during the year 2022/2023. The examiner of the old course may offer the exam of the new course as the exam for the old course, if the knowledge tested in the exam, is covered by the content of the old course.