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.

<u>General</u>
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.

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[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

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[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

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[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 .

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[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 <u>unrecorded</u> 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.

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[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

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[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;

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[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

MASTER COMPUTER SCIENCE (CS)

MASTER INTERNET SCIENCE AND TECHNOLOGY (IST)

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 in Computer Science with the underlying specialisations 4TU Cyber Security (CybSec, organized within the 4TU.Federatie as a cooperation of the University of Twente with the Technical University of Delft), Data Science and Technology (DST), and Software Technology (ST) and the Master's programme and specialisation in Internet Science and Technology (IST).

B1. GENERAL PROVISIONS

Article B1.1 Definitions
In addition to the definitions in Section A the following definitions and abbreviations are used:

a. **Course programme:** examination programme
b. **CybSec:** Cyber Security
c. **DST:** Data Science and Technology
d. **SDS:** Sports Data Science, a sub-specialisation within Data Science and Technology
e. **Graduation supervisor**: examiner of the research group chosen by the student to graduate with
f. **IST:** Internet Science & Technology
g. **Programme mentor**: individual appointed by the Examination Board to approve course programmes for their specific specialisation
h. **ST**: Software Technology
i. **TUD:** Delft University of Technology. Courses of the CybSec specialisation indicated with TUD are taught at the UT via tele-lecturing. The Delft EER applies to these courses.

B2. PROGRAMME OBJECTIVES AND FINAL ATTAINMENT TARGETS

Article B2.1 Aim of the Computer Science Master's programme
The Master's programme in Computer Science aims to combine a scientific mindset with specialist technical knowledge, enabling graduates to analyze, design, validate and implement state-of-the-art ICT systems in their operational context. Graduates of the Master's programme are trained to take a scientific, ethical and socially responsible approach to conducting and contributing to research in their specific area of study and to international trends in and related to their field of study.

Article B2.2 Aim of the Internet Science and Technology Master's programme
The Master's programme in Internet Science and Technology aims to combine a scientific mindset with specialist technical knowledge, enabling graduates to design, analyze, validate and implement complex networked systems. Graduates of the Master's programme are trained to take a scientific, ethical and socially responsible approach to conducting and contributing to research in their specific area of study and to international trends in and related to their field of study.

Article B2.3 General attainment targets
The degree programmes have the following general scientific attainment targets

a. Graduates have an extensive knowledge of and understand the issues relevant to their specific field of study (i.e. domain specific attainment targets) described in Art. B2.4.
b. Graduates can contribute to scientific research, and independently design, conduct and present the results of small-scale research.
c. Graduates can provide an original contribution to the development and/or application of the field of study. 'Original' is understood to mean 'demonstrative of a creative contribution'.
d. Graduates can analyze complex problems relevant to the field of study and obtain the required knowledge and information.

e.   Graduates can design, validate and implement solutions/systems in their operational context; identify and apply relevant advanced knowledge, methods and techniques from their field of study.

f.   Graduates can assess solutions/systems and their applications according to their properties and potential to solve problems even if they are new to or unfamiliar with the situation or lack information and/or reliable information; they can use their assessment as a basis for (substantiation of) decisions.

g.   Graduates understand the ethical, social, cultural and public aspects of problems and solutions in their field of study; apply this insight in their international role as scholar.

h.   Graduates can work as part of and play a leading role in a team; manage and plan a development process; document development and research processes.

i.   Graduates can substantiate research results, designs and applications in writing and verbally; critically assess and participate in debates regarding the same.

j.   Graduates can independently acquire new knowledge and skills; reflect on trends in their field of study, responsibilities and roles and use this insight as a guide for and integrate it into their own personal development.

k.   Graduates can integrate information from other disciplines into their own work if necessary.

l.   Graduates take a critical approach to reading, incorporating information presented in and participating in debates regarding international scientific literature relevant to their field of study.

Article B2.4 Domain specific attainment targets

a. Cyber Security

1.   CybSec graduates have a profound understanding of security and privacy risks and mitigations in cyber space and are able to model and evaluate these risks and mitigations.

2.   CybSec graduates have understanding and skills of applying the relevant foundations of cyber security, such as cryptography, formal methods, statistics, machine learning, and data analytics.

3.   CybSec graduates have understanding and skills of cyber security engineering methodologies in the small and in the large.

4.   CybSec graduates have insight into cross-disciplinary aspects of cyber security such as law, psychology, economics, governance, and management, and are able to read and understand basic texts from those domains and communicate with experts from those domains on cyber security.

5.   CybSec graduates have understanding and skills of methods and approaches for practical security evaluation of ICT systems such as penetration testing, risk assessment, and monitoring & analytics.

6.   CybSec graduates have specialist knowledge and understanding of one or more sub-fields or aspects of cyber security, typically acquired via research in the final year project.

7.   CybSec graduates have practical experience conducting scientific research into cyber security, contributing to such research, applying the results, following the trends of this sub-field and contributing to its further development.

b. Data Science and Technology
1. DST Graduates have thorough knowledge of, and are able to design solutions for, the management of large volumes of structured, semi-structured and unstructured data, such as sensor data, multimedia data, textual data, geographic data, and social data.
2. DST Graduates are able to analyze large volumes of generated data and make scientific decisions based on such data sets.
3. DST Graduates understand algorithms underlying data science techniques in terms of their fundamental basis in theory (probability theory, statistics, information theory, etc).
4. DST Graduates have thorough knowledge of methods and techniques for the design and analysis of smart services, including those applicable to all stages of an information system's life cycle (requirement analysis, architecture design, realization and maintenance) and subsystems that make up information systems.

c. Software Technology
1. ST graduates have a thorough knowledge and understanding of the different phases of the software lifecycle (ranging from requirements engineering over architectural and detailed design to construction and quality assurance) as a scientific and design discipline.
2. ST graduates have a thorough knowledge and understanding of, as well as practical experience with, the application of software engineering methods and tools in the development and validation of large-scale systems.
3. ST graduates know the trade-offs between alternative software engineering techniques and can make educated decisions throughout the software lifecycle.
4. ST graduates have knowledge and understanding of various aspects of Software Engineering including its mathematical background, software management, quality assurance, architectural design, detailed design, software construction, testing, and verification.
5. ST graduates have specialist knowledge and understanding of one or more sub-fields or aspects of the software engineering discipline, e.g., programming languages, requirements engineering, software composition, software evolution, service-oriented architectures, model-driven engineering, logic, algorithms, and formal methods.
6. ST graduates have practical experience conducting scientific research in the realm of software engineering methods and technologies, formal methods and/or programming or design paradigms, enabling them to contribute to such research, follow the trends, and apply the results.

d. Internet Science and Technology
1. IST graduates have thorough knowledge about and understanding of both wired and wireless communication devices, networks and systems, in terms of both key principles and contemporary technologies.
2. IST graduates can design and evaluate wired and wireless communication devices, networks and systems; in doing so, they can take into account both detailed aspects of the individual components, and system-wide aspects such as security and management.
3. IST graduates can quantitatively evaluate the performance of networked systems, and judge their formal correctness, using both analytical methods and computer tools.

4. IST graduates have practical experience conducting research and/or doing design work in a sub-field of networked systems, can follow trends in the field and contribute to its further development.

B3. FURTHER ADMISSION REQUIREMENTS

Admission requirements additional to the ones in Article 2 of section A can be found in Appendix I.

B4. CURRICULUM STRUCTURE

Article B4.1 Composition of the programme

1. The general composition of the course programme is as follows[12]:
   a. Core courses: mandatory courses depending on the specialisation.
   b. Advanced courses: courses depending on the specialisation.
   c. Profiling space: around 30 EC in courses related to the specialisation.
   d. 191612680 Computer Ethics, (5 EC)
   e. 192199508 Research Topics (10 EC)
   f. 192199978 Final Project (30 EC)
2. Each student has an individual course programme of at least 120 EC which meets the general programme guidelines of B4.1.1, and also the programme requirements of their selected specialisation described in B6 specialisations.
3. In addition to Article B4.1.1 and B4.1.2, students with a Bachelor's degree which includes "educatieve minor" may use the elective credits within the profiling space to form an alternate package of 30 EC with didactical/pedagogical subjects, including a traineeship in a high school, as part of a Science Education and Communication (SEC) Master's programme under the terms of Article A3.6.
4. To ensure basic knowledge in the field of study and the specialisation selected, the Admissions Board or Programme mentor may adjust the programme requirements on the basis of the student's prior education and training. Such an adjustment will never entail an intensification of the total study load, the programme will always have a study load of 120 credits.
5. Students take around 30 EC in courses related to the specialisation as part of their profiling space. Apart from additional requirements depending on the specialisation, this space should be used for:
   a. an exchange programme
   b. an internship (192199968, 20EC)
   c. the study tour (10 EC)
   d. a methodological course from the theme OOO (organize / research / design)
   e. additional advanced specialisation courses
   f. courses from another CS specialisation
   g. courses from a different Master which are relevant to the specialisation

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[12] Students whose admission to the CS programme is derived from, or constitutes a part of, their admission to a programme within the EIT Digital Master school, may have a course programme which deviates from the requirements listed under Art. B 4.1.1. The programme for EIT CybSec students is described in Art. B 6.1.4, the one for EIT Data Science and Technology in Art. B6.2.4.

    h.   courses at one of our 4TU partner programmes
    i.   courses from a different Master for a double / combined programme
    j.   homologation courses with a maximum of 15EC, as part of a bridging programme assigned by the Admissions Board or Programme mentor as referred to in B4.1.4

6. When an 192199968 internship is included in an individual course programme, the 192199978 Final Project can only be carried out at the UT, at another university or at a research institute and not also at an external company.
7. Exceptions to the composition of the programme can be approved by the Examination Board.

Article B4.2 Course programme approval

1. Every student is required to obtain course programme approval from the Programme mentor of their selected specialisation
2. The programme approval is an agreement on the content of a student's individual course programme between the student and the Programme mentor. The Programme mentor approves a programme on behalf of the Examination Board.
3. Students are allowed to complete courses and sit examinations up to a maximum of 15 credits in a specialisation before contacting the Programme mentor for an approved course programme. After 15 credits permission from the Programme mentor is required for complete programme of 120 credits.
4. Until Research Topics and Final Project are started by the student, the approved course programme can still be altered by laying down a new revised course programme. At that time the Programme mentor should have approved the 120-credit course programme in its entirety.
5. In principle, the student will earn the programme diploma if they complete the units of study listed in the course programme and earns results in line with the guidelines for passing the final degree audit.
6. If the approved course programme does not satisfy the regulations as described in these Regulations and/or does not satisfy the conditions imposed by the Admissions Board, the Examination Board is authorized to impose additional diploma eligibility requirements.

Article B4.3 Approval of a Flexible-degree programme

The Examination Board shall decide on reasoned requests from students for a Flexible degree programmes as referred to in Article 7.3c of the Act and A3.5. Conditions related to this matter are to be specified in the Rules and Guidelines of the Examination Board.

B5. RESEARCH TOPICS AND FINAL PROJECT

Article B5.1 Research Topics

1. All students must take Research Topics course as part of their course programme.
    a.   Students in the regular programme take 192199508 Research Topics (10EC)
    b.   Students in the EIT Digital Master School programme take 10 EC split into 201800524 Research Topics EIT (4EC) and 201800525 I&E Study EIT (6EC).

2. Research Topics serve as a preparation for the Final Project described in Article A3.7 and B5, and therefore has to immediately precede the graduation work. Students cannot start Research Topics before having obtained at least 60EC, but are recommended to start at 75 credits.
3. Students start Research Topics by registering in Osiris and subsequently Mobility Online.

Further information and procedures can be found on the programme website www.utwente.nl/csc. These procedures are considered part of this Regulation.

Article B5.2 Additional rules and procedures for the Final Project

1. In addition to the rules in Article A3.7, all students must carry out a Final Project under the graduation supervisor, a staff member from one of the responsible research groups of the specialisation, with the following requirements:
    a. The Final Project deals with carrying out a research project, delivering of a graduation report and a summary of the report, and finally an oral presentation in public at the University of Twente (even when some of the contents are confidential under Article A3.11). Generally the Research Topics as described in Article B5.1 immediately precede the graduation work, and serve as a preparation for the Final Project.
    b. Students may start the Final Project with a maximum of 10 EC of unfinished courses, unless the graduation supervisor deems the content of the unfinished courses essential with regards to the chosen topic of the Final Project. Students can start by registering in Osiris and subsequently Mobility Online
    c. Faculty research groups take responsibility for supervision and assessment of the Final Project. Responsibility implies:
        ● either the graduation committee contains a member of the group
        ● or the Programme mentor has explicitly given permission for supervising the Final Project by a graduation committee containing no member of the group.
        The responsibilities are as follows:
            ● Cyber security: SCS or DACS
            ● Data science and Technology: SCS or DMB or FMT
            ● Software technology: FMT
            ● Internet science and technology: DACS or PS.
2. The Final Project description is written down as an agreement (by filling out the online Graduation registration form in Mobility Online), signed by both the student and the supervisor. The supervisor signs on behalf of the Examination Board.

Organizational procedures are found on Canvas, after registering in Osiris and on the programme website www.utwente.nl/csc.These procedures are considered part of this Regulation.

Article B5.3 Assessment and marking of the Final Project

1. If student and supervisor agree on the necessity of an extension of the duration of the Final Project (e.g. because of illness or because of an unforeseen re-examination of a pending course) they may request the Programme Mentor (of the specialisation in which the Final Project takes place) to give permission for such an extension. The Programme Mentor may give permission for an extension once, with a maximum duration of three months.
2. If an additional extension is needed, or if the desired extension period is longer than three months, or if the supervisor and the Programme Mentor are the same person, such a request has to be submitted to the Examination Board.
3. The composition of the assessment committee is described in A3.8 of the Faculty Section A.

4. In case the final grade of the Final Project is insufficient the student has to carry out a new Final Project.

B6. SPECIALISATIONS

Article B6.1 MSc Computer Science: Cyber Security

1. Core courses
The following 4 courses are mandatory:
- 201700074 Internet Security (InS, UT)
- 201500027 Security and Cryptography (Crp, TUD)
- 201600051 Software Security (SoS, UT)
- 201500026 Cyber Risk Management (CRM, TUD)

2. Advanced courses
At least 3 courses must be chosen out of the following:
- 192110940 Secure Data Management (SDM, UT)
- 201700083 Security Services for the Internet of Things (SSI, UT)
- 201500039 Security Verification (SeV, UT)
- 201700086 System Security (SyS, UT)
- 192140122 System Validation (SyV, UT)
- 201500037 Cyber Data Analytics (CDA, TUD)
- 201500042 Privacy Enhancing Technologies (PET, TUD)
- 201700079 Blockchain and Distributed ledger technology (BCT, UT)
- 201500040 Introduction to Biometrics (Bio, UT)
- 202000026 Secure Cloud Computing (SCC, UT)
- 202100073 Empirical Security Analysis & Engineering (ESA, UT)

3. Profiling space
Requirements:
- At least 3 socio-technical courses (see next item)

Socio-technical courses (at least 3)
- 201100022 Cyber Crime Science (CCS, TUD)
- 201500038 E-Law (UT)
- 201500041 Cyber Security Management (CSM, UT)
- 201500028 Economics of Security (EoS, TUD)
- 201900124 Capstone Cyber Security (Cap, TUD)
- 202100272 User-Centered Security (UCS, TUD)
- 202200001 Introduction to Cloud as Infrastructure (ICI, TUD)
- Other socio-technical courses (in consultation with the Programme mentor)

Additional Cyber Security Courses
- Additional advanced courses (mentioned above)
- 201500033 Applied Security Analysis (ASA, TUD)
- 201500030 Fundamentals of Quantum information (**4EC**, Q101, TUD)
- 201600016 Quantum comm. and Cryptography (Q201, TUD)

- 201500036 Software Testing and Reverse engineering (STR, TUD)

Other elective courses
- 192620010 Mobile and Wireless Networking (MWN, UT)
- 201400177 Cloud Networking (CIN, UT)
- 201600070 Machine Learning 1 (BML, UT)
- 192130112 Distributed Systems (DiS, UT)

4. EIT Digital Master School: Cyber Security

A special way to fulfil the requirements of the Cyber Security specialisation is by successfully completing the course programme on Cyber Security in the EIT Digital Master School, set up as a double degree programme where one year is completed at the University of Twente and one year at a partner university. The partner universities in the EIT Digital Master programme on Cyber security are:
- University of Trento, Italy (both entry and exit year curricula; specialisation: Applied Security)
- Eötvös Loránd University, Hungary (both entry and exit year curriculum; specialisation: Advanced Cryptography)
- University of Turku, Finland (both entry and exit year curriculum; specialisation: Security of Networked Systems)
- University of Rennes 1, France (only entry year curriculum; specialisation: Software Security)
- EURECOM, France (only exit year curriculum; specialisation: Mobile and Cloud Security)

a. Entry year

The entry year of EIT Digital Cyber Security follows the rules for the Master's programme in Computer Science. The total amount of credits during the entry year must be at least 60 EC. The exit year is completed at a partner university and will consist of at least a graduation project and a minor in Innovation & Entrepreneurship (I&E).

The following course is mandatory for all Computer Science students:
- 191612680 Computer Ethics (UT)

Core courses
The following 9 courses are mandatory:
- 201700074 Internet Security (InS, UT)
- 201500027 Security and Cryptography (Crp, TUD)
- 201600051 Software Security (SoS, UT)
- 201500026 Cyber Risk Management (CRM, TUD)
- 201700180 Innovation and Entrepreneurial Finance for EIT students (UT)
- 201700119 Business Development Lab I (UT)
- 201700120 Business Development Lab II (UT)
- 201700086 System Security (SyS, UT)
- 201400613 EIT Summer School (external) (**4EC**)

At least 2 courses must be chosen out of the following:

Advanced courses
- 201700083 Security Services for the Internet of Things (UT)
- 201500039 Security Verification (SeV, UT)

- 201500040 Introduction to Biometrics (Bio, UT)
- 201500037 Cyber Data Analytics (CDA, TUD)
- 201500042 Privacy Enhancing Technologies (PET, UT)
- 201700079 Blockchain and Distributed ledger technology (BCT, UT)
- 201500036 Software Testing and Reverse engineering (STR, TUD)
- 201100022 Cyber Crime Science (CCS, TUD)
- 201500038 E-Law (UT)
- 192620010 Mobile and Wireless Networking (MWN, UT)
- 202100272 User-Centered Security (UCS, TUD)

Profiling
Elective Innovation and Entrepreneurship (I&E) courses
- 201700019 Brand Management (UT)
- 201800077 Bioresource Business Development & Management (UT)
- 201800079 Bioresource Supply Chain Management (UT)
- 201600155 Global Strategy and Business Development (UT)
- 194105070 Information Systems for the Financial Services Industry (UT)
- 201500008 Empirical Methods for Designers (UT)
- 201600015 Strategic Technology Management and Innovation (UT)
- 201500080 Advanced Topics in Digital Marketing (UT)
- 201800205 Smart Industry (UT)
- 201800230 Advanced Project in Impact, Innovation & Entrepreneurship (UT)

Socio-technical courses
Please see the list of socio-technical courses in the Cyber Security specialisation (Art. B6.1.3).

Additional Cyber Security courses
- Additional advanced courses (see Art. B6.1.2)
- 201400177 Cloud Networking (ClN, UT)

Other suggested courses
- 201600070 Machine learning 1 (BML, UT)
- 201600071 Machine learning 2 (AML, UT)
- 201700075 Internet of Things (IoT, UT)
- 192130112 Distributed Systems (DiS, UT)

b. Exit year: specialisation "Cyber Security: High Tech, Human Touch"
Exit year students have completed the equivalent of our core and advanced programme in the entry year at one of our partner universities.
The exit year counts at least 60 EC consisting of the following mandatory parts for all Computer Science students: 191612680 Computer Ethics (5 EC), and the 192199978 Final Project (30 EC).

Instead of the course "Research Topics", EIT exit year students do:
- 201800524 Research Topics EIT (4EC)
- 201800525 I&E Study EIT (6EC)

For the remainder of the 60EC, the student needs to pick at least 15 EC from the following courses:

- 201500028 Economics of Security (EoS, TUD)
- 202000026 Secure Cloud Computing (SCC, UT)
- 201500041 Cyber Security Management (CSM, UT)
- 192140122 System Validation (SyV, UT)
- 201500030 Fundamentals of Quantum Information (Q101, TUD, **4EC**)
- 201500026 Cyber Risk Management (CRM, TUD)
- 192110940 Secure Data Management (SDM, UT)
- 201500039 Security Verification (SeV, UT)
- 201500040 Introduction to Biometrics (Bio, UT)
- 202001323 Governance of Cybersecurity (GoC, TUD)
- 201600016 Quantum Cryptography (Q201, TUD)
- 201600070 Machine Learning 1 (MaL, UT)
- 201700075 Internet of Things (IoT, UT)
- 201400177 Cloud Networking (ClN, UT)
- 192130112 Distributed Systems (DiS, UT)
- 201600071 Machine Learning 2 (AML, UT)
- 201700079 Blockchain and Distributed Ledger Technology (BCT, UT)
- 201100022 Cyber Crime Science (CCS, TUD)
- 201500036 Software Testing and Reverse Engineering (STR, TUD)
- 192620010 Mobile and Wireless Networking (MWN, UT)
- 201500037 Cyber Data Analytics (CDA, TUD)
- 201500038 E-Law (UT)
- 201700083 Security Services for the Internet of Things (SSI, UT)
- 202100073 Empirical Security Analysis & Engineering (ESA, UT)

Further details on the programme can be found on: masterschool.eitdigital.eu/programmes/cse.

5. Grade rounding policy for Cybersecurity courses offered by TU Delft

Cybersecurity courses that are offered by TU Delft (marked with TUD in the courses listed above) follow the grade rounding policies as defined in Art. 17 of the Delft Rules and Regulations of the board of examiners EEMCS. Delft courses do NOT follow the Twente rounding rules as defined in Art. A4.4 of the Twente education and examination regulations for the computer science master (see above); only Twente courses follow the Twente rounding rules.

Important consequence: The teacher of each course is responsible to apply the respective grade rounding policy and as such decides on whether a student has passed or failed the course. The Delft rounding rules are slightly different from the Twente rules and for instance allow for a 5.5 (= fail in Delft) as final mark which does not exist in the Twente system. As a 5.5 is a failing mark in Delft. Any final grade for a Delft course > 5.0 and < 5.8 is transferred to a 5.0 in the Twente system to properly reflect the fact that the student has failed the course.

Article B6.2 MSc Computer Science: Data Science and Technology

1. Core courses

The following 4 courses are mandatory:
- 201200044 Managing Big Data
- 201400174 Data Science
- 201600070 Machine Learning 1

- 201700080 Information Theory and Statistics

2. Advanced courses

At least 4 courses must be chosen out of the following:
- 201600071 Machine Learning 2
- 202200103 Image Processing and Computer Vision
- 201800177 Deep Learning - From Theory to Practice
- 201600076 Foundations of Information Retrieval or 201600074 Natural Language Processing[13]
- 192320111 Architectures of Information Systems[14]
- 201700081 Probabilistic programming[3]
- 193810020 Advanced Techniques for Signal Analysis[15]
- 201500363 Data Science additional topics[4]
- 202001583 Sports Interaction Technology: Designing Interactive Systems for Sports[4]
- 191571090 Time Series Analysis[4]

3. Profiling space

Requirements: No additional requirements apply, but the data science student is suggested to further specialize in one or more of the following data science profiles. Students opting for the sub-specialisation in Sports Data Science (SDS) need to complete at least 27 additional credits of mandatory profiling courses on Human Movement Science, to have it mentioned on their degree supplement.

Data Science profiles
  a) *specialist in specific kinds of data*, such as natural language text, image data, geographic data, sensor data, networked data
  b) *designer of smart services*
  c) *designer of data science algorithms*
  d) *multi-disciplinary researcher*
  e) *specialist in sports and human movement data, devices and measurement techniques*

The following are suggested courses for the profiling space:
- (a) 201600083 Advanced Information Retrieval
- (a) 201600081 Advanced Natural Language Processing
- (a) 201600075 Speech Processing
- (a) 201600082 Advanced Speech processing
- (a,b) 201700075 Internet of Things
- (a,b) 202100263 Linked Data and Semantic Web
- (a,b) 201500042 Privacy-Enhancing Technologies
- (a,b,c,d,e) 201300074 Research Experiments in Databases and Information Retrieval (REDI)
- (a,b,c,d,e) 202000029 Empirical and Design Science Research in Information Systems
- (a,b,c,d,e) 201500527 Capita Selecta DST

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[13] Students can do both, but only one will count as an advanced course and the other as an elective in the profiling space.
[14] The courses 'Probabilistic programming' and 'Architectures of Information Systems' are considered advanced courses only for the DST study program. They can be electives for DST-SDS students.
[15] The courses 'Advanced Techniques for Signal Analysis', 'Sports Interaction Technology' and 'Time Series Analysis' are considered advanced courses only for DST-SDS students. DST students can select them as electives.

- (a,c) 201800222 Complex Networks
- (a,c) 201500040 Introduction to Biometrics
- (a,c) 201700364 Spatial Statistics
- (a,d) 201800063 Traffic Forecasting and Analysis
- (a,d) 201500363 Data Science Additional Topics
- (a,d,e) 193810020 Advanced Techniques for Signal Analysis
- (a,e) 201100254 Advanced Computer Vision and Pattern Recognition
- (b) 201400277 Enterprise Architecture
- (b) 191820210 Simulation
- (b) 202000027 Enterprise Security
- (b) 192376500 Business Process Integration lab
- (b) 192320501 Electronic Commerce
- (b) 201100051 Information Services
- (b) 192652150 Service-oriented Architecture Web Services
- (b,d) 202100258 FAIR Principles and the FAIRification process
- (b,d) 202000028 Smart Industry
- (b,d,e) 201600028 Telemedicine and Data Analysis for Monitoring
- (c) 191506103 Statistics and Probability
- (c) 192135310 Modeling and Analysis of Concurrent Systems
- (c) 201900115 Statistical Learning
- (c) 201400353 Signals with Information
- (c) 191520751 Graph Theory
- (c) 192111092 Advanced Logic
- (c,e) 191571090 Time Series Analysis
- (c,d) 202100112 Graphical Models and Causality
- (d) 201700196 Advanced Simulation for Health Economic Analysis
- (d,e) 202001583 Sports Interaction Technology: Designing Interactive Systems for Sports
- (c) other courses on fundamentals and algorithms of signal processing, stochastic processing, etc.
- (d) other courses on data analysis from fields like health/medicine, social sciences, business sciences, bio-informatics, engineering.

The following are mandatory profiling courses on Human Movement Sciences for the SDS sub-specialization. They are provided by teachers of the VU Amsterdam:
- 202100140 Anatomy (6EC)
- 202100141 Training and Performance (physiology part) (3EC)
- 202100142 Measuring Human Movement (6EC)
- 202100143 Applied Biomechanics (6EC)
- 202100144 Concepts in Human Movement Sciences (6EC)

The following is an optional profiling course on Human Movement Sciences for the SDS sub-specialization, provided by teachers of the VU Amsterdam:
- 202100145 Electromyography (3EC)

4. EIT Digital Master School: Data Science
A special way to fulfil the requirements of the Data Science & Technology specialisation is by successfully completing the course programme on Data Science in the EIT Digital Master School, set up as a double

degree programme where one year is completed at the University of Twente and one year at a partner university. The partner universities in the EIT Digital Master programme on Data Science are:
- [16]Eindhoven University of Technology, The Netherlands (both entry and exit year curricula; specialisation: Business Process Intelligence)
- KTH Royal Institute of Technology, Stockholm, Sweden (both entry and exit year curricula; specialisation: Distributed Systems & Data Mining for Big Data)
- Technical University of Madrid, Spain (both entry and exit year curricula; specialisation: Infrastructures for Large Scale Data Management and Analysis)
- Université Côte d'Azur, Nice, France (both entry and exit year curricula; specialisation: Multimedia and Web Science for Big Data)
- Politecnico di Milano, Italy (only entry year curriculum)
- University Paris-Saclay[17], France (both entry and exit year curricula; specialisation: Natural Language Processing)
- Aalto University, Helsinki, Finland (both entry and exit year curricula; specialisation: Machine Learning, Big Data Management, and Business Analytics)
- Eötvös Loránd University, Budapest, Hungary (both entry and exit year curricula; specialisation: Real-time Data Analytics)
- University of Rennes 1, France (both entry and exit year curricula; specialisation: Artificial Intelligence & Data Mining for Business Intelligence)
- Technical University of Berlin, Germany (only exit year curriculum; specialisation: Design, Implementation, and Usage of Data Science Instruments)
- University of Trento, Italy (only exit year curriculum; specialisation: Big Data Variety and Veracity)

a. Entry year

The entry year of EIT Digital Data Science follows the rules for the Master's programme in Computer Science. The total amount of credits during the entry year must be at least 60 EC. The exit year is completed at a partner university and will consist of at least a graduation project and a minor in Innovation & Entrepreneurship (I&E).

Mandatory for all Computer Science students
- 191612680 Computer Ethics

Core courses
The following 4 courses are mandatory:
- 201200044 Managing Big Data
- 201400174 Data Science
- 201600070 Machine Learning 1
- 201700080 Information Theory and Statistics

Advanced courses
At least 4 courses must be chosen out of the following:
- 201600071 Machine Learning 2
- 202200103 Image Processing and Computer Vision

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[16] This university cannot be chosen in combination with the University of Twente, because both are in The Netherlands

[17] Formerly known as Université Paris-Sud.

- 201800177 Deep Learning - From Theory to Practice
- 201600076 Foundations of Information Retrieval or 201600074 Natural Language Processing[18]
- 192320111 Architectures of Information Systems
- 201700081 Probabilistic programming

NB: students are allowed to propose similar courses at the exit university to cover core or advanced courses. This has to be approved by the Programme mentor. Furthermore, a grade transcript of the exit university needs to be provided in the end to prove that the covering courses have at least the same amount of ECs as the equivalent course at the UT and have been passed.

Profiling space
Requirements:
- All mandatory Innovation and Entrepreneurship (I&E) courses, see below
- No additional requirements apply, but the data science student is suggested to further specialize in one or more of the following data science profiles:
  - *specialist in specific kinds of data*, such as natural language text, image data, geographic data, sensor data, networked data
  - *designer of smart services*
  - *designer of data science algorithms*
  - *multi-disciplinary researcher*

Innovation and Entrepreneurship (I&E) courses
Mandatory I&E courses
- 201700180 Innovation and Entrepreneurial Finance for EIT students
- 201700119 Business Development Lab I
- 201700120 Business Development Lab II
- 201400613 EIT Summer School (external) (4 EC)

Elective I&E courses:
- 201700019 Brand Management
- 201800077 Bioresource Business Development & Management
- 201800079 Bioresource Supply Chain Management
- 201600155 Global Strategy and Business Development
- 194105070 Information Systems for the Financial Services Industry
- 201500008 Empirical Methods for Designers

The following are suggested courses for the profiling space:
- (a) 201600083 Advanced Information Retrieval
- (a) 201600081 Advanced Natural Language Processing
- (a) 201600075 Speech Processing
- (a) 201600082 Advanced Speech processing
- (a) 201100254 Advanced Computer Vision and Pattern Recognition
- (a,b) 201700075 Internet of Things
- (a,b) 202100263 Linked Data and Semantic Web
- (a,b) 201500042 Privacy-Enhancing Technologies
- (a,b,c,d) 201300074 Research Experiments in Databases and Information Retrieval (REDI)

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[18] Students can do both, but only one will count as an advanced course and the other as an elective in the profiling space.

- (a,b,c,d) 202000029 Empirical and Design Science Research in Information Systems
- (a,b,c,d) 201500527 Capita Selecta DST
- (a,c) 201500040 Introduction to Biometrics
- (a,c) 201800222 Complex Networks
- (a,c) 201700364 Spatial Statistics
- (a,d) 201800063 Traffic Forecasting and Analysis
- (a,d) 201500363 Data Science Additional Topics
- (a,d) 193810020 Advanced Techniques for Signal Analysis
- (b) 201400277 Enterprise Architecture
- (b) 191820210 Simulation
- (b) 202000027 Enterprise Security
- (b) 192376500 Business Process Integration lab
- (b) 192320501 Electronic Commerce
- (b) 201100051 Information Services
- (b) 192652150 Service-oriented Architecture Web Services
- (b,d) 202100258 FAIR Principles and the FAIRification process
- (b,d) 202000028 Smart Industry
- (b,d) 201600028 Telemedicine and Data Analysis for Monitoring
- (c) 191506103 Statistics and Probability
- (c) 192135310 Modeling and Analysis of Concurrent Systems
- (c) 201900115 Statistical Learning
- (c) 201400353 Signals with Information
- (c) 191520751 Graph Theory
- (c) 192111092 Advanced Logic
- (c) 191571090 Time Series Analysis
- (c,d) 202100112 Graphical Models and Causality
- (d) 201700196 Advanced Simulation for Health Economic Analysis
- (d,e) 202001583 Sports Interaction Technology: Designing Interactive Systems for Sports
- (c) other courses on fundamentals and algorithms of signal processing, stochastic processing, etc.
- (d) other courses on data analysis from fields like health/medicine, social sciences, business

b. Exit year: specialisation "Data Science for Persona Information"

Exit year students have completed a programme in the entry year at one of our partner universities. Nevertheless, students need to comply with our requirements for a core and advanced programme (see below). Students are expected to show how the courses in their programme at the entry university cover at least most of the core and advanced courses with at least the same amount of EC as the core and advanced courses at the UT. This has to be approved by the Programme mentor. The intention is that students minimize the number of core and advanced courses they still have to do in their exit year, so that sufficient room for electives remain. A grade transcript of the entry university needs to be provided in the end to prove that the covering courses have at least the same amount of ECs and have been passed.

The exit year counts at least 60 EC. It consists of the following parts

Mandatory for all Computer Science students
- 191612680 Computer Ethics
- 192199978 Final Project (30 EC)

Core courses
The following 4 courses are mandatory:
- 201200044 Managing Big Data
- 201400174 Data Science
- 201600070 Machine Learning 1
- 201700080 Information Theory and Statistics or 191506103 Statistics and Probability

Advanced courses
At least 3 courses must be chosen out of the following:
- 201600071 Machine Learning 2
- 191210910 Image Processing and Computer Vision
- 201800177 Deep Learning - From Theory to Practice
- 201600076 Foundations of Information Retrieval or 201600074 Natural Language Processing[19]
- 192320111 Architectures of Information Systems
- 201700081 Probabilistic programming

Research Topics
Instead of the course "Research Topics"*,* EIT exit year students do:
- 201800524 Research Topics EIT (4EC)
- 201800525 I&E Study EIT (6EC)

Profiling space
For the remainder of the 60EC in the exit year and to retrieve the 120EC for the total programme, the student needs to pick from the following courses:
- 201600028 Telemedicine and Data Analysis for Monitoring
- 201500222 Technology for Health
- 201400353 Signals with Information
- 201500040 Introduction to Biometrics
- 201100254 Advanced Computer Vision & Pattern Recognition
- 201700075 Internet of Things
- 201400408 Complex Networks
- 202100258 FAIR Principles and the FAIRification process
- 202001583 Sports Interaction Technology: Designing Interactive Systems for Sports
- The above courses are specifically suggested for the EIT specialisation "Data Science for Persona Information". They are course related to topics such as health and sports, wellbeing, biometrics and privacy. Any other course suggested for the profiling space of the Data Science & Technology programme is also allowed.

Further details on the programme can be found on: http://masterschool.eitdigital.eu/programmes/dsc

Article B6.3 MSc Computer Science: Software Technology

1. Core course
The following 4 courses are mandatory:
- 202001472 Software Testing and Risk Assessment
- 192140122 System Validation

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[19] Students can do both, but only one will count as an advanced course and the other as an elective in the profiling space.

- 192111332 Design of Software Architecture
- 201700082 Principles of Programming, Processes and Patterns

2. Advanced courses
At least 4 courses must be chosen out of the following:
- 192111092 Advanced logic
- 192340041 Software Management
- 192135450 ADSA – Model-Driven Engineering
- 192652150 Service-oriented Architecture Web Services
- 192135310 Modeling and Analysis of Concurrent Systems
- 201900082 Graph Algorithms and Complexity
- 201400225 Software Evolution
- 202100126 Interactive Theorem Proving

3. Profiling space
Requirements: Choose at least one orientation: design or research (10 EC)

Orientation
Mandatory course for the Design Orientation (10EC):
- 201400172 Industrial Software Engineering Project (10 EC)[20]

Mandatory courses for the Research Orientation (10EC):
- One of the courses marked "Software Science"
- 201400171 Capita Selecta Software Technology

Suggested elective courses
- Additional advanced courses
- 201600051 Software Security
- 201200006 Quantitative Evaluation of Embedded Systems
- 192620300 Performance Evaluation
- 201700081 Probabilistic Programming
- 201600070 Machine Learning 1
- 201400174 Data Science
- 201600040 Requirements Engineering Processes and Methods
- 202100113 Probabilistic Model Checking (Software Science)
- 202100114 Graph Transformations (Software Science)
- 202100115 Program Verification (Software Science)
- 202100116 Model Checking and Parity Games (Software Science)

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[20] The courses 192199968 internship and 201400172 ISEP cannot both be part of a regular programme of 120 EC due to overlap in content and learning goals. In particular, students who choose the Design Orientation thus cannot take the Internship except as an additional elective resulting in a course programme of at least 140 EC.

Article B6.4 MSc Computer Science: Internet Science and Technology[10]

1. Core courses
The following 4 courses are mandatory:
- 192620010 Mobile and wireless networking
- 192620300 Performance evaluation
- 201700075 Internet of Things
- 201700074 Internet security

2. Advanced courses
At least 4 courses must be chosen out of the following:
- 201700077 Advanced Networking
- 192652150 Serv. Oriented Arch. with Web Serv.
- 201400177 Cloud Networking
- 201700073 Ad-Hoc Networks
- 202001579 Internet Measurements
- 202100244 Pervasive computing
- 192130112 Distributed Systems
- 201700083 Security Services for the Internet of Things
- 202100073 Empirical Security Analysis and Engineering
- 201400176 Dependable Networking

3. Profiling space
Requirements: No additional requirements apply.

Suggested elective courses
- additional advanced courses
- Electrical Engineering courses (www.utwente.nl/ee)
- Embedded Systems courses (www.utwente.nl/emsys)
- Cyber Security courses
- Data Science & Technology courses
- Software Technology courses

Article B6.5 MSc Computer Science: specialisation Internet Science and Technology[21]
As of September 2020 the Master's programme in Internet Science and Technology will no longer be offered as a separate Master's programme to starting students. Instead the Master will continue on as a specialisation of Computer Science. Students studying in the MSc Internet Science and Technology can continue their programme until September 2023 or switch to the Computer Science IST specialisation. See also Article B6.4.

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[21] It is not allowed to combine the MSc Internet Science and Technology and the CS specialization Internet Science and Technology with regards to Art. A3.6.

B7. DEGREE

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

B8. EVALUATION AND QUALITY ASSURANCE

In addition to the rules and procedures described in Article A3.12, the following rules describe the internal course evaluations cycle:
1. The online Student Experience Questionnaire (SEQ) is used for evaluation purposes at the conclusion of each courses;
2. Lecturers reflect on the SEQ results with a reflection form send in by lectures as part of the course evaluation cycle
3. Additionally, the lecturer may initiate supplementary evaluations, such as additional surveys and panel discussions during the course or at its conclusion;
4. If the SEQ results and/or student complaints give reason for concern, then the programme director is to discuss the matter with the lecturer either during the course or at its conclusion;
5. Lecturers are to use this discussion to develop a plan for improving the remainder of the course or for the subsequent edition, including a strategy for evaluating the improvements.

B9. TRANSITIONAL AND FINAL PROVISIONS

Article B9.1 Transitional provisions

The transitional arrangements can be found in appendix B.

Article B9.2 Publication

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

Article B9.3 Effective date

These Regulations enter into force with effect from 1 September 2022.

I. ADMISSIONS APPENDIX

This is the Admissions Appendix describing admission to the Master's programme in Computer Science. Enrolment as a student is required to sit examinations and to be eligible to earn the Master's diploma. In order to be enrolled, students must demonstrate that they have been admitted to one of the Master's programmes.

Article I.1 Admission to the programme

1.   The admissions appendix forms an integral part of these regulations. The regulations in this appendix are part of the Education and Examination regulations of the Master's programmes Computer Science and Internet Science and Technology of the Faculty of Electrical Engineering, Mathematics and Computer Science of the University of Twente and are an addition to regulations stated in section A.
2.   Admission to the programme can be granted only to students who meet the requirements regarding the level of their previously earned diploma's, in accordance with the provisions of Art.7.30b of the Act.
3.   Students in possession of a diploma which shows that they have passed the final degree audit for the Technical Computer Science (UT), Computer Science and Engineering (TUD, TU/e), Business Information Technology (UT) or Informatica (RUG, UU, UvA, VU, UL, RU, OU) Bachelor's programme will be eligible for direct admission to the programmes.
4.   Students who are not in possession of the diploma mentioned in paragraph 2 and 3 will require a certificate of admission issued by the Admissions Board. The Admissions Board is appointed by the Dean with the power to act in matters of admission to the programme. Admission involves an assessment of the student's eligibility for the Master's programme of their choice. If the Admissions Board positively assesses an application for admission, it issues a certificate of admission. Students with a certificate of admission are eligible for enrolment by the Central Student Administration. Enrolment will only take place if the other admission requirements maintained by the UT have also been satisfied.
5.   Notwithstanding the provisions of paragraph 2, 3, and 4, the Dean may under special circumstances admit a student to one or more examinations and/or practicals of the programme before the student has passed the Bachelor's final degree audit. A limited period of validity may be set for such permission.
6.   Admission of foreign students. In addition to the requirements in Chapter 2 of section A, the following criteria apply:
    a.   The level of education in the country in which the student has completed their pre-university education: this must be comparable with that in the Netherlands.
    b.   Level of knowledge: the student must have accumulated sufficient knowledge on the basis of the courses they have studied abroad to be at a level comparable to that of Dutch students who are admitted to the Master's programme.

Article I.2 Admission to the programme pursuant to a specific regulation

The Dean has adopted the following provisions for certain students to be eligible for admission (next to the ones mentioned in Article I.1).

In addition to these provisions from the Education and Examination Regulation:
1.   Applicants who satisfy the following requirements are eligible for admission to the CS Master's programme.

      a.   The applicant is holder of a diploma from a University of Applied Science demonstrating that they have satisfied the requirements of the final assessment of the Computer Science (Informatica) Bachelor's programme, the Technical Computer Science (Technische informatica) Bachelor's programme or a HBO ICT Bachelor's programme

      b.   The applicant has successfully completed the transfer minor (*doorstroomminor*) as part of their Bachelor's course programme

2.   Applicants who satisfy the following requirements are eligible for admission to the CS Master's programme.

      a.   The applicant is holder of a diploma from the University of Twente demonstrating that they have satisfied the requirements of the final assessment of the Advanced Technology Bachelor's programme, the Creative Technology Bachelor's Programme, or the Bachelor's programme from University College Twente (ATLAS)

      b.   The applicant has successfully completed two out of the following modules as part of their Bachelor's course programme:
- Computer Systems for CS (15EC)
- Software Systems core (12EC)
- Network Systems for EE (15EC)
- Discrete Structures & Efficient Algorithms (15EC)

Article I.3 Admission to the Master's programmes after individual assessment

In all other instances than those mentioned in Art. I.1 and I.2., the Admissions Board conducts a detailed assessment of the applicant's eligibility for admission. This assessment takes the following factors into account:

1. the highest diploma earned by the applicant: This must be at least a Bachelor's diploma from a recognized higher education institution. If such a diploma cannot be produced, the Admissions Board will ask for a statement attesting to the equivalency of the applicant's qualifications with the Bachelor's diploma required. The body issuing this statement must be authorized to do so.
2. the nature of the degree course and the content of the course programme completed by the applicant, the speed with which the course programme was completed and the marks earned: The nature of the degree course, content of the course programme and marks earned for the individual units of study must clearly demonstrate that the applicant has the fundamental academic skills and appropriate basic knowledge for the Master's programme or is able to compensate for any gaps in basic knowledge.
3. the student's motivation for applying for admission
4. the applicant's command of English: This only applies to international students. The threshold values for sufficient command of English are in Article A2.2.

Article I.4 Variations in admission decisions

1.   <u>Issuing an unconditional certificate of admission</u>

The Admissions Board may decide to admit applicants to the Master's programme after assessing their file. These applicants will be issued a (unconditional) certificate of admission.

2.   <u>Issuing a conditional certificate of admission</u>

The Admissions Board may not reach a final decision about admission, because it finds insufficient or formally incorrect evidence of the applicant's status in the application file. In such a case the board can decide to admit the applicant conditionally. The student can enroll at the UT on the condition they submit the evidence lacking in the original application file to the satisfaction of the Admissions Board. (A typical case of conditional admission is when the applicant's file shows no formal proof of sufficient proficiency in English.)

3.   Issuing a certificate of pre-master admission

In some cases, the Admissions Board will issue applicants a certificate of pre-master admission. While these individuals may enroll at the UT, they are not entitled to sit examinations or to have the final degree audit conducted.

Pre-master admission is associated with a pre-master's programme, i.e. a list of units of study, the attainment targets and learning objectives of which are at the undergraduate level. The pre-master's programme is defined containing courses on the aspects that are lacking in the BSc programme taking into account the necessary knowledge to successfully complete the Master's programme.

Students in this category must first successfully complete this pre-master's programme to be fully admitted to the Master's programme and become fully enrolled students with all the associated rights. Certificates of pre-master admission are valid for a limited term (generally one year). Students who are not fully admitted during this term must re-apply for admission.

4.   Issuing a certificate of admission with additional requirements

The Admissions Board may attach additional requirements to a certificate of admission (also to conditional and pre-Master admissions). These additional requirements do not impact the right to enroll, sit examinations or have the final degree audit conducted. They do, however, impact the regulations governing successful conclusion of the Master's programme final assessment.

With this admission decision, the Admissions Board establishes additional requirements for the course programme to satisfy in order to successfully pass the Master's programme final assessment. Naturally, the additional requirements will be limited to the extent that the student will still be able to complete the programme with a study load of 120 credits. The additional requirements placed on the course programme are referred to as "homologation".

5.   Issuing a certificate of admission with a requirements waiver

Article A3.4 of the Education and Examination Regulation stipulates that the Examination Board may not honor requests for exemptions based on results earned as part of a Bachelor's programme. However, the Examination Board may waive a requirement placed on the course programme in recognition of the results earned as part of a Bachelor's programme and, consequently, permit the student to successfully pass the Master's programme final assessment with a course programme that does not satisfy all the formal requirements. Students who wish to have a waiver for requirements placed on the course programme based on their undergraduate education must submit a request to the Admissions Board. The Admissions Board will render a decision on the request on behalf of the Examination Board. If granted, it will issue a certificate of admission with a waiver for requirements, thereby granting the student the right to have the Master's programme final assessment conducted without meeting all the formal requirements. Such a waiver will never affect the Master's programme study load. A study load requirement of less than 120 credits is not permitted.

II. TRANSITIONAL ARRANGEMENTS APPENDIX

This is the Transitional Arrangements Appendix to the Education and Examination Regulations of the Master's programmes Computer Science and Internet Science and Technology.

1. The transitional arrangements appendix forms an integral part of these regulations.
The regulations in this appendix are part of the education and examination regulations of the Master's programmes Computer Science and Internet Science and Technology of the Faculty of Electrical Engineering, Mathematics and Computer Science of the University of Twente.

2. Regulation regarding approved course programmes
In general students who have their course programme approved are allowed to take the degree based on that approved programme unless this contradicts with another regulation or is no longer possible. In case the changes are not covered by any of the regulations in these transitional arrangements, students must contact their Programme mentor for an adjustment of their course programme.

3. Regulation 2021-2022 regarding the discontinuation of the Internet Science and Technology Master's programme
Occasion: This regulation is necessary because Internet Science and Technology will be discontinued as a separate Master's programme per September 2023. Instead it will continue to exist as specialisation within the Computer Science Master's programme.
Term of validity: until September 1, 2023.
Contents of the regulation: Students who have their course programme approved will be allowed to finish their Master's programme up and until 31 August 2023. After this date students in the Master Internet Science and Technology will need to transfer to the IST specialization of the Computer Science Master programme to finish their degree.