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TEACHING AND EXAMINATION REGULATIONS

Master's programmes in Electrical Engineering and Mechatronics

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CHAPTER 1 GENERAL PROVISIONS

SECTION 1 TERMS AND OBJECTIVES

Article 1.1 Definition of terms

The following terms and definitions apply to this regulation:

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|-----|---------------------------|--|
| a. | the Act: | the Higher Education and Scientific Research Act (Bulletin of Acts, Orders and Decrees 593, 1992); |
| b. | the University: | the University of Twente; |
| c1. | Faculty of EEMCS | the University's Faculty of Electrical Engineering, Mathematics and Computer Science |
| c2. | the Faculty of ET | the University's Faculty of Engineering Technology |
| c3. | the EE Department | the Department of Electrical Engineering at the Faculty of EEMCS |
| c4. | chair | a chair as defined in the faculty regulations of the Faculty of EEMCS |
| c5. | department | an academic department within the Faculty of ET |
| c6. | the examination board: | the board stated in Article 7.12 of the Act, for the programme referred to below in subsection d. |
| c7. | the supervisor | the professor referred to in Article 2.8, paragraph # and Article 3.9 paragraph 3 of these regulations |
| d1. | the EE Master's programme | the Master's programme in Electrical Engineering in accordance with Article 7.3a of the Act, paragraph 1, subsection b |
| d2. | the MT Master's programme | the Master's programme in Mechatronics in accordance with Article 7.3a of the Act, paragraph 1, subsection b |
| e. | unit: | a unit of study as referred to in Article 7.3 paragraph 2 of the Act; |
| f. | student ¹ : | a person who is registered in this capacity for the higher education programme; |

¹ In the interests of readability, the male pronoun is used throughout to refer to both sexes.

- g. non-degree student: a person who is registered in this capacity for the higher education programme;
- h. free choice programme: the higher education programme that can be composed by the student in accordance with Article 7.3b of the Act;
- i. practical exercise: a practical,
a written thesis;
a project or design concept,
research or design assignments,
completing an internship,
participation in fieldwork and excursions
participation in other educational activities which are regarded as essential and aimed at mastering the prescribed skills.
- j. the prospectus: the university prospectus or the electronic version thereof, containing the most recent descriptions of the units as determined by the dean or programme director
- k. teaching timetable: the department's timetables which show the periods and times when classes are taught and examinations can be taken.
- l. EC European Credit (EC), a credit as referred to in Article 7.4 of the Act.
- m. programme director the director of one of the programmes referred to in subsection d
- n. study advisers members of staff appointed to this role by the deans of one of the faculties referred to in subsection c.
- o. mentor a person appointed by a chair or department for the general supervision of students or prospective students at the chair or department
- p. placement coordinator the person or persons appointed by the Faculty of EEMCS or ET to fulfil this role
- q. admissions board board established by the dean with the authority to act on his behalf in matters regarding the admission of students to the programme.

Article 1.2 Applicability of the regulations

These regulations apply to the teaching and examinations of the Master's programmes in Electrical Engineering and Mechatronics at the University.

Article 1.3 Aim of the Master's programmes

The Master's programme in Electrical Engineering aims to train Master's students in a range of professional and personal skills to enable them to expand their knowledge of the subject and relevant methodology through analysis of and research into innovative systems in a specific discipline.

The aims and final attainment targets of the Master's programme in Electrical Engineering are summarized in Appendix B.

SECTION 2 DEGREE PROGRAMMES AND EXAMINATIONS

Article 1.4 Full-time degree programmes

The Master's programmes are only taught on a full-time basis.

Article 1.5 Scope of the programmes.

The Master's programmes each include a total of 120 ECs.

Article 1.6 Examinations and levels of distinction

1. All Master's programmes culminate in the Master's degree audit.
2. If the examination board is of the opinion that the candidate has shown evidence of outstanding quality within the context of the Master's degree audit, the board may decide to award the degree "with distinction". The words "with distinction" will be stated on the degree certificate awarded at the relevant audit. The examination board is responsible for drawing up the criteria pertaining to granting a distinction.

Article 1.7 Form of assessment

1. The way in which the various units of study are to be completed is stipulated in Chapter 2 for the Master's programme in EE and in Chapter 3 for the Master's programme in MT.
2. In exceptional individual circumstances, the examiner of a particular unit of study may permit deviations from the provisions of paragraph 1; in other exceptional cases, the examination board may permit deviations.

3. Notwithstanding the provisions of paragraph 1, degree students and non-degree students with a physical or sensory disability shall be afforded an opportunity to take the examinations in a manner which takes maximum account of their individual disability. If necessary, the examination board or the examiner will obtain expert advice before making a decision on such matters.

Article 1.8 Oral examinations

1. Oral exams are taken in public, unless the examination board decides otherwise due to extraordinary circumstances.
2. A student or examiner who wishes third parties to be present during an oral exam must inform the examination board at least 10 working days prior to this exam.
3. If the examination board has determined that members of the examination board (or an observer representing the examination board) are to be present during an oral exam, this is made known to the examiner and the student at least one working day prior to the exam.

Article 1.9 Validity of examinations

1. A successfully completed unit of study is valid for a term of six years.
2. The student can submit a request to the examination board to have the validity of a result as referred to in paragraph 1 extended. The examination board may not refuse this request without a valid reason. The examination board will provide a written justification if it turns down this request.
3. The results of exams that are part of a series or combination of exams are valid only during the academic year in which they are achieved. The examiner of the unit of study may determine an alternative arrangement. In this case the examiner will inform the examination board accordingly. The alternative arrangement must be made known via the electronic learning environment (Blackboard).

Article 1.10 Right of inspection

1. The student is entitled to an explanation of the results of an exam from the examiner. If no collective discussion of the results is held, the student may submit a request for a discussion of the results to the examiner within two weeks of publication of the exam results. This discussion, or a collective discussion, must be held within five weeks of the publication of the exam results. After this term of five weeks has elapsed, the student will no longer have the right to a discussion of the results of an exam and an explanation of the assessment by the examiner.
2. The examiner responsible for the assessment of a student's written exam is also responsible for ensuring that this work is kept on file in the administration of the relevant chair or department for at least two years following publication of the results. The student has the right of access to this work during this two-year period.
3. The examination board may permit deviations from the provisions of paragraphs 1 and 2.

Article 1.11 Registration and publication of the exam results

1. The result of a written exam or practical exercise is published via the Student Information System (SIS) within 20 working days.

2. The result of an oral exam is made known to the student within one working day in the form of an authorized proof of result provided by the examiner.
3. The provisions of paragraph 2 do not apply if the oral exam is part of a series of oral exams from the same unit of study, which take place on more than one working day. In such cases, the examiner will determine the result within one working day after concluding the series of oral exams.
4. If the result of a unit of study is based on the completion of one or more assignments, writing a paper or producing a thesis, then the date of submission for the final assignment, paper or thesis will count as the examination date.
5. Should the examiner not be able to meet the terms described in paragraphs 1 and 2 due to extraordinary circumstances, he will report this to the examination board, stating the reasons. The examination board will inform the student of the delay as soon as possible, stating the new term within which the result will be made known. If the examination board is of the opinion that the examiner has not met his/her obligations, it may appoint another examiner to ascertain the result of the exam.
6. If a second examination opportunity is planned shortly after the first, the results of the first examination will be published at least ten working days prior to the second examination to allow the student ample preparation time.
7. The student can request a certified study progress overview from the Student Services Desk in de Vrijhof if required.
8. If a student receives more than one valid result for one and the same unit of study, the most favourable result will apply.

Article 1.12 Exemptions

1. The examination board can, at a student's request, grant that student an exemption from an examination or practical exercise. If applicable, the examiner in question may be consulted first.
2. The grounds on which the examination board can grant exemption from a specific examination pertain solely to the level, content and quality of examinations or tests previously taken by the student, or knowledge, insight and skills acquired by the student outside of the sphere of university education.
3. Students may also be exempted from assignments or practical exercises by the examination board if they can demonstrate that a specific assignment or practical exercise, or the execution of such assignment or exercise, will confront them with a moral dilemma. In such cases the examination board decides whether the practical exercise or assignment can be carried out in another manner. Any such alternative will be determined by the examination board.

SECTION 3 STUDY PROGRESS AND STUDENT SUPERVISION

Article 1.13 Study progress and student supervision

1. The programme director of each of the Master's programmes referred to in Article 1.1 of these regulations will inform himself of the study progress made by students who have registered for the Master's programme in question.

2. Before the Master's programme begins, the student will consult his intended supervisor or another designated person to discuss the composition of his Master's programme.
3. The consultation referred to in paragraph 2 will result in a study plan signed by the student and the other person taking part in the consultation.
4. Every student has a mentor who discusses the student's study progress with him at least once during each semester.
5. The student is free to contact the study adviser whenever he wishes to do so.
6. At the request of a student with a physical or sensory disability, the examination board decides that he will be afforded an opportunity to take examinations in a manner which takes maximum account of his individual disability.

SECTION 4 FURTHER RULINGS

Article 1.14 Further rulings

A chair or department may draw up additional rules with regard to the implementation of the teaching and examination regulations to the extent that it concerns the area pertaining to the chair or department's own teaching.

SECTION 6 LANGUAGE

Article 1.16 Language

1. The Master's programmes are taught in English. Students will sit their examinations in English, unless the examiner grants a student's request to sit the exam in Dutch. The report on the business internship must be written in English, unless the company in question explicitly expresses the wish that the report be written in Dutch. The report on the Master's assignment will be written in English. Presentations will be given in English.
2. Students must have a sufficient command of English in order to be admitted to the programme. The admissions board will test the candidate's language skills in accordance with the University's guidelines.
3. The dean will issue regulations regarding the assessment of the English language skills of the programme's teaching and support staff. Staff are required to meet the language

requirements stated in these regulations. Courses will be offered to staff to give them the opportunity to improve their English language skills.

SECTION 7 PENALTIES

Article 1.17 Penalties

1. In the event that bodies or individuals repeatedly fail to comply with the rules set out in these regulations, the dean may impose penalties. The examination board may also impose penalties within its area of authority.
2. In cases where penalties are being considered, the dean and the examination board will consult one another before any penalties are imposed.

CHAPTER 2 MASTER'S PROGRAMME IN ELECTRICAL ENGINEERING

SECTION 1 THE CONTENT OF THE PROGRAMME AND RELATED REGULATIONS

Article 2.1 The scope and composition of the Master's programme

1. The Master's programme consists of the following units, with the study load listed in European Credits (EC):

a. practical exercise:	
business internship	20 ECs
Master's graduation project	40 ECs
b. non-technical units	10 ECs
c. standard electives	20 ECs
d. free-choice units	30 ECs

2. Philosophy of Engineering accounts for 5 ECs of 1b. Students are free to make up the other 5 ECs by selecting from the range of non-technical units of at least 3 ECs taught at any university. At the written request of the student, the examination board can grant permission for the full 10 ECs or a portion thereof to be obtained by alternative means in cases where the student's educational background or knowledge otherwise obtained constitutes sufficient grounds for this.

3. The standard electives take the form of 3 or 4 units determined by the supervisor in consultation with the student.

4. The free-choice units are study units which each carry a study load of 3 ECs or more. The free-choice units are chosen by the student after consultation with the supervisor.

5. The examination board may decide to oblige international students and students who have completed a course of study at a university of applied sciences (HBO) to complete an

individual assignment instead of the business internship referred to in paragraph 1 subsection a and/or to prescribe or permit deviations from the provisions of paragraph 1 for these categories of students.

Article 2.2 Special features of study units

1. The prospectus states which of the units referred to in Article 2.1 paragraph 1 subsections b, c and d involve a practical exercise. If a practical exercise is part of such a study unit, a student cannot sit the examination unless he has completed and passed the practical exercise. In individual cases, the examiner for such a study unit may decide that a student may sit the examination if the practical exercise has not or not yet been completed and passed, but that the result will not be determined until the student has passed the practical exercise.
2. The assessments of the practical exercises referred to in Article 2.1 paragraph 1 subsection a or otherwise referred to in paragraph 1 above can only be obtained once the student has taken part in the practical exercise.

Article 2.3 Prerequisite knowledge

1. Students will only be granted permission to start a business internship once they have obtained their Bachelor's degree and have passed the standard electives (Article 2.1.1c) and the study unit Philosophy of Engineering (Article 2.1.2). Students must have obtained at least 45 European Credits for study units that form part of the Master's phase.
2. Students can only start the Master's graduation project once they have completed and passed the business internship. If a student is not required to complete a business internship, he cannot start the Master's graduation project unless he meets the requirements for participation in the internship stated in paragraph 1.
3. If the completion of a unit as referred to in Article 2.1 subsection c and d is subject to the requirement that another unit must have been successfully completed first, this requirement will be stated in the prospectus under the heading "prerequisite knowledge".
4. In exceptional individual cases, the examiner of a unit of study may waive the requirement that a particular unit can only be completed on condition that one or more other units have first been successfully completed.

Article 2.4 The number of times that units may be taken

1. For each unit referred to in Article 2.1, paragraph 1, subsections b, c and d, students are given the opportunity to complete the unit at least twice per academic year. If a practical

exercise forms part of such a unit, students are given at least one opportunity per academic year to carry out the practical exercise.

2. For each unit referred to in Article 2.1, paragraph 1, subsection a, students are given the opportunity to complete the unit at least once per academic year.
3. If a unit referred to in Article 2.1, paragraph 1, subsection d is temporarily not taught in a particular academic year, there will still be at least one opportunity to take an examination in that unit during that same academic year.

Article 2.5 Periods for examinations and practical exercises

1. The assessment for units referred to in Article 2.1, paragraph 1, subsections b, c and d can be taken immediately after the period in which the preparatory tuition is given or at some other time in the same academic year to be decided subsequently.
2. The business internship can be completed during a period to be determined by the placement coordinator, in consultation with the student and the organization concerned. Within two months of the end of that period, the student is required to submit a written report of the internship, as referred to in Article 2.6.2, to the supervisor, referred to in Article 2.7.3.
3. The Master's graduation project can be carried out under the auspices of the relevant chair in a period to be determined in consultation with the student.
4. In response to a reasoned request from a student or on other grounds, examiners may also decide to administer an examination outside the period mentioned in Article 1.

Article 2.6 Form of assessment

1. The units referred to in Article 2.1, paragraph 1, subsections b, c and d may be assessed by means of a written exam or, if the examiner so decides, by means of an oral exam. The relevant examiner may determine that the assessment for such a unit will take the form of a written thesis or a written research report on an assignment set by him.
2. The assessment of the business internship will be made on the basis of performance during the internship and a written report on the work completed.
3. The assessment of the Master's graduation project will be made on the basis of performance during the assignment, a written report on the work completed and a presentation about the assignment.

Article 2.7 Supervision of the internship

1. The assignment to be completed by a student during his internship must be detailed in a description drawn up and approved in advance by a member of academic staff with relevant expertise and employed by the faculty on a permanent basis.
2. The day-to-day supervision of the internship is conducted by the organization where the internship is being carried out.
3. A member of academic staff with relevant expertise and employed by the faculty on a permanent basis supervises the student from a distance. If, in the opinion of this supervisor, adequate day-to-day supervision is not or no longer possible, he can decide to take charge of the day-to-day supervision. When the internship is over, this supervisor will act as examiner for this unit, as referred to in Article 2.6.2.

Article 2.8 Supervision of the Master's graduation assignment

1. The Master's graduation project to be completed by a student must be detailed in a description drawn up and approved in advance by a member of academic staff with relevant expertise who is affiliated with the associated chair and employed by the faculty on a permanent basis.
2. The Master's graduation assignment is usually carried out within a chair of the faculty. Even in cases where the assignment is conducted outside of the faculty, a faculty chair is always assigned responsibility for ensuring that the assignment runs smoothly.
3. The composition of the supervisory committee for the Master's thesis project is made up of at least 4 people, at least two of whom should be members of the academic staff permanently employed by the faculty and one of whom should be the person in charge of day-to-day supervision. One of these two staff members should be the professor of the chair under whose responsibility the assignment is being carried out. The supervisory committee should also include one member of the permanent academic staff from a chair other than that from which the student will graduate.
4. The committee referred to in paragraph 3 appoints a supervisor who is responsible for day-to-day supervision.
5. The programme director can draw up rules for completing the assignment outside the faculty.

SECTION 2 ADMISSION TO THE MASTER'S PROGRAMME

Article 2.9 Admission on the grounds of an uncompleted Bachelor's programme

1. If a student has not yet successfully completed the final Bachelor's assessment, as mentioned in Article 7.13 paragraph # of the Act², the examination board may, at the reasoned written request of the student, allow him to register for the Master's programme in Electrical Engineering, provided that the examination board is of the opinion that the student has completed a sufficient number of units of the Bachelor's programme with sufficiently good results to take part in this Master's programme successfully.
2. The examination board will draw up guidelines for providing the permission referred to in the first paragraph. In doing so, the examination board may determine that the student cannot take certain parts of the Master's programme or the relevant examinations until he has obtained his Bachelor's degree.

Article 2.10 Admission to the Master's programme in Electrical Engineering

1. Where a candidate does not meet the criteria for admission to the Master's programme in Electrical Engineering based on the stipulations in Article 7.30a of the Act, the admissions board will, on request, provide a declaration as proof of admission stating whether and on what grounds the candidate meets the admissions criteria.
2. Where a candidate does not meet the criteria for admission to the Master's programme in Electrical Engineering based on the stipulations in Article 7.30a of the Act, at least one of the following admissions criteria must apply:
 - possession of a Bachelor's or *kandidaats* certificate from a university programme in the Netherlands which, in the opinion of the admissions board, offers the prospect of the student completing the Master's programme within the allotted period.
 - possession of a *doctoraal* or Master's degree certificate from a university programme in the Netherlands which, in the opinion of the admissions board, offers the prospect of the student completing the Master's programme within the allotted period.
 - possession of a Bachelor's or Master's degree certificate from a university programme outside the Netherlands which, in the opinion of the admissions board, offers the prospect of the student completing the Master's programme within the allotted period.
 - if the candidate does not possess one of the certificates mentioned above but does have an educational background in combination with knowledge and experience applied subsequently which, in the opinion of the admissions board, amounts to the equivalent of one of the certificates mentioned, the admissions board may decide that the candidate nevertheless meets the admissions criteria, as long as, in the opinion of

² This only refers to the Bachelor's programmes for which the Master's programme in Electrical Engineering is a "follow-up programme".

the admissions board, there is a realistic prospect of the student completing the Master's programme within the allotted period.

3. In the declaration referred to in paragraph 1, the admissions board may determine that units specified by the board must be part of the student's Master's programme or that the student may be granted exemptions for certain sections of the Master's programme, with the exception of the Master's graduation project.
4. Repealed.
5. If a candidate has passed the Bachelor's assessment at a university of applied sciences (*hbo-instelling*) in Electrical Engineering or a related subject or a university Bachelor's assessment in a subject related to Electrical Engineering and if analysis of this programme reveals that any lack of knowledge can be compensated for with an educational programme with a maximum study load of 30 ECs, he will be given the opportunity to complete such a programme which, under the rules set by the examination board, grants admission to the Master's programme in Electrical Engineering. If justified by the number of candidates, the programme director can decide to offer candidates a standard compensation programme. Any such programme is defined by the programme director in consultation with the admissions board.

CHAPTER 3 MASTER'S PROGRAMME IN MECHATRONICS

SECTION 1 ORGANIZATION

Article 3.1 Organization and structure

1. The Master's programme in Mechatronics is taught jointly by the faculties of EEMCS and ET.
2. The Faculty of EEMCS is the coordinating body for the Master's programme in Mechatronics.

SECTION 2 THE CONTENT OF THE PROGRAMME AND RELATED REGULATIONS

Article 3.2 The scope and composition of the Master's programme

The Master's programme consists of the following components, with the study load listed in European Credits (EC):

a. practical exercises:

business internship 20 ECs

Master's graduation project 40 ECs

b. Philosophy of Engineering 5 ECs

c. standard electives 20 ECs

d. free-choice units 20 ECs

e. homologation courses 15 ECs

3. The standard electives take the form of 3 or 4 units with a joint study load of 20 ECs determined by the supervisor in consultation with the student.
4. The free-choice units are study units which each carry a study load of 3 ECs or more. The free-choice units are chosen by the student after consultation with the supervisor.
5. Homologation courses are those taken to compensate for any shortcomings in the Bachelor's programme leading up to the Master's. Homologation courses are determined by the programme director, after consultation with relevant specialists from the faculties of EEMCS and ET.
5. The examination board may decide to oblige international students and students who have completed a course of study at a university of applied sciences (HBO) to carry out an individual assignment instead of the business internship referred to in paragraph 1, subsection a and/or to prescribe or permit deviations from the provisions of paragraph 1 for these categories of students.

Article 3.3 Special features of study units

1. The prospectus states which of the units referred to in Article 3.2, paragraph 1, subsections b, c and d involve(s) a practical exercise. If a practical exercise is part of such a study unit, a student cannot sit the examination unless he has completed and passed the practical exercise. In individual cases, the examiner of such a study unit may decide that a student may sit the examination if the practical exercise has not or not yet been completed and passed, but that the result will not be determined until the student has passed the practical exercise.
2. The assessments of the practical exercises referred to in Article 3.2, paragraph 1, subsection a or otherwise referred to in paragraph 1 above can only be obtained once the student has taken part in the practical exercise.

Article 3.4 Prerequisite knowledge

1. Students can only participate in the business internship once they have completed and passed the homologation courses referred to in Article 3.2. paragraph 1, subsection e, and the units referred to in Article 3.2, subsection c and 3 of more of the units referred to in Article 3.2, subsection d, and the unit referred to in Article 3.2, paragraph 1, subsection b. Students must have obtained at least 45 European Credits for study units that form part of the Master's phase.
2. Students can only participate in the Master's graduation project once they have completed and passed the business internship. If a student is not required to complete a business internship, he cannot start the Master's graduation project unless he meets the requirements for participation in the internship stated in paragraph 1.

3. The sequence in which the units referred to in Article 3.2, subsections c and d must be completed is stated for each unit in the prospectus under the heading “prerequisite knowledge”.
4. In exceptional individual cases, the examiner of a unit of study may waive the requirement that a particular unit can only be completed on condition that one or more other units have first been successfully completed.

Article 3.5 The number of times that units may be taken

1. For each unit referred to in Article 3.2, paragraph 1, subsections b, c d and e, students are given the opportunity to complete the unit at least twice in each academic year. If a practical exercise forms part of such a unit, students are given at least one opportunity a year to carry out the practical exercise.
2. For each unit referred to in Article 3.2, paragraph 1, subsection a, students are given the opportunity to complete the unit at least once in each academic year.
3. If a unit referred to in Article 3.2, paragraph 1, subsection d is temporarily not taught in a particular academic year, there will still be at least one opportunity to take an examination in that unit during that same academic year.

Article 3.6 Periods for examinations and practical exercises

1. The assessment for units referred to in Article 2.1, paragraph 1, subsections b, c, d and e can be taken immediately after the period in which the preparatory tuition is given or at another time in the same academic year to be decided subsequently.
2. The business internship can be completed during a period to be determined by the placement coordinator, in consultation with the student and the organization concerned. Within two months of the end of this period, the student is required to submit a written report of the internship, as referred to in Article 3.7.2, to the supervisor, referred to in Article 3.8.3.
3. The Master’s graduation project can be carried out under the auspices of the relevant chair in a period to be determined in consultation with the student.
4. In response to a reasoned request from a student or on other grounds, examiners may also decide to administer an examination outside the period mentioned in paragraph 1 of this Article.

Article 3.7 Form of assessment

1. The units referred to in Article 3.2, paragraph 1, subsections b, c, d and e may be assessed by means of a written exam or, if the examiner so decides, by means of an oral exam. The relevant examiner may decide that the assessment for such a unit will take the form of writing a thesis or writing a report on a research assignment set by him.
2. The assessment of the business internship will be made on the basis of the performance during the internship and a written report on the work carried out.
3. The assessment of the Master's graduation project will be made on the basis of the performance during the assignment, a written report on the work carried out and a presentation about the assignment.

Article 3.8 Supervision of the internship

1. The assignment to be carried out by a student during his internship must be detailed in a description drawn up and approved in advance by a member of academic staff with relevant expertise employed by one of the participating faculties on a permanent basis.
2. The day-to-day supervision of the internship is conducted by the organization where the internship is being carried out.
3. A member of academic staff who has relevant expertise and is employed by one of the participating faculties on a permanent basis supervises the student from a distance. If, in the opinion of this supervisor, adequate day-to-day supervision is not or no longer possible, he can decide to take charge of the day-to-day supervision. When the internship is over, this supervisor will act as examiner for this unit, as referred to in Article 3.7.2.

Article 3.9 Supervision of the Master's graduation assignment

1. The Master's graduation project to be completed by a student must be detailed in a description drawn up and approved in advance by a member of academic staff with relevant expertise who is affiliated with the chair associated with the assignment and employed by the relevant faculty on a permanent basis.
2. The Master's graduation assignment is usually carried out within a chair of one of the participating faculties. Even in cases where the assignment is conducted outside the faculty, a chair of one of the participating faculties is always assigned responsibility for ensuring that the assignment runs smoothly.
3. The day-to-day supervision of the Master's graduation project is carried out by a committee consisting of 3, 4 or 5 persons, at least two of whom should be members of the academic staff permanently employed by the university; these two supervisors may or may not be affiliated with the same faculty. One of these two supervisors must be a professor.

4. The committee referred to in paragraph 3 appoints a supervisor responsible for day-to-day supervision.
5. The programme director can draw up rules for carrying out the assignment outside the faculty.

SECTION 2 ADMISSION TO THE MASTER'S PROGRAMME

Article 3.10 Admission on the grounds of an uncompleted Bachelor's programme

1. If a student has not yet successfully completed the final Bachelor's assessment, as stated in Article 7.13 paragraph # of the Act³, the examination board may, at the reasoned written request of the student, allow him to register for the Master's programme in Electrical Engineering, provided that the examination board is of the opinion that the student has completed a sufficient number of units of the Bachelor's programme with sufficiently good results to successfully take part in this Master's programme.
2. The examination board will draw up guidelines for granting the permission referred to in the first paragraph. In doing so, the examination board may determine that the student cannot take certain parts of the Master's programme or the relevant examinations until he has obtained his Bachelor's degree.

Article 3.11 Admission to the Master's programme in Mechatronics

1. Insofar as a candidate does not meet the criteria for admission to the Master's programme in Mechatronics based on the stipulations in Article 7.30a of the Act, the examination board will, on request, draw up a declaration as proof of admission stating whether and on what grounds the candidate meets the admissions criteria.
2. Where a candidate does not meet the criteria for admission to the Master's programme in Mechatronics based on the stipulations in Article 7.30a of the Act, at least one of the following admissions criteria must apply:
 - possession of a Bachelor's or *kandidaats* certificate from a university programme in the Netherlands which, in the eyes of the examination board, offers the prospect of the student completing the Master's programme within the allotted period.
 - possession of a *doctoraal* or Master's degree certificate from a university programme in the Netherlands which, in the view of the examination board, offers the prospect of the student completing the Master's programme within the allotted period.

³ This only refers to the Bachelor's programmes for which the Master's programme in Mechatronics is a "follow-up programme".

- possession of a Bachelor's or Master's degree certificate from a university programme outside the Netherlands which, in the opinion of the examination board, offers the prospect of the student completing the Master's programme within the allotted period. In such cases, the examination board will at least consult the internationalization coordinator, in addition to an expert in the field of the candidate's choice, before making its judgment.
 - if the candidate does not possess a certificate as stated above but does have an educational background in combination with knowledge and experience applied subsequently which, in the opinion of the examination board, amounts to the equivalent of one of the certificates stated, the admissions board may decide that the candidate nevertheless meets the admissions criteria, as long as, in the opinion of the admissions board, there is a realistic prospect of the student completing the Master's programme within the allotted period.
3. In the declaration referred to in paragraph 1, the examination board may determine that units specified by the board must be part of the student's Master's programme or that the student may be granted exemptions for certain sections of the Master's programme, with the exception of the Master's graduation project.
 4. In the declaration referred to in paragraph 1, the examination board can determine that, regardless of the fact that the candidate meets the academic requirements, he can only be admitted to the Master's programme if, in the board's opinion, he has a sufficient command of the English language, both written and spoken, to meet the implicit requirements of the Master's programme. See also Article 1.16, paragraph 2.
 5. If a candidate has passed the Bachelor's assessment at a university of applied sciences (*hbo-instelling*) in Electrical Engineering or Mechanical Engineering or a related subject, or a university Bachelor's assessment in a subject related to Electrical Engineering or Mechanical Engineering and if analysis of this programme reveals that any lack of knowledge can be compensated for by taking a educational programme with a maximum study load of 30 ECs, he will be given the opportunity to complete such a programme which, under the rules set by the examination board, grants admission to the Master's programme in Mechatronics. If justified by the number of candidates, the programme director can decide to offer candidates a standard compensation programme. Any such programme is defined by the programme director in consultation with the examination board.

CHAPTER 4 SPECIAL CIRCUMSTANCES

SECTION 1 EXTENDED ASSESSMENT

Article 4.1 Extended assessment

1. Those who, either before or after passing the final degree assessment of one of the Master's programmes referred to in the previous two chapters, have passed an examination in a unit which does not or did not in the past form part of these or other study programmes but which could have formed part of the Master's programmes referred to, may at their own request be given an extended assessment on this subject if the examination board approves this.
2. As proof that this extended assessment has been successfully completed, the examination board can issue a separate declaration on request.

SECTION 4 THE FREE-CHOICE MASTER'S PROGRAMME

Article 4.2 Terms

1. The free-choice Master's programme refers to a programme in which, with the permission of the most closely related examination board, the units are selected by the student from the range provided by an institute and which are subject to a final assessment in accordance with Article 7.3c of the Act.
2. With regard to the permission referred to in the first paragraph, the examination board identifies the programme to which the student's free-choice programme belongs.

Article 4.3 Permission from the examination board

The examination board draws up guidelines for the granting of permission referred to in Article 4.2 subject to the condition that the free-choice programme forms a cohesive whole, the level of which is comparable to that of the Master's programme described in Chapter 2 or 3, and complies with the rules stated in Article 4.4.

Article 4.4 The composition of the free-choice Master's programme

1. The free-choice Master's programme should contain at least one unit that is comparable to the Master's graduation project of the Master's programme referred to in Chapter 2 or 3 of these regulations; the scope of this unit should be no less than 30 ECs and no more than 50 ECs.

2. The free-choice Master's programme may contain one unit that is comparable to the business internship of the Master's programme referred to in Chapter 2 or 3 of these regulations; the scope of this unit should be no less than 20 ECs and no more than 30 ECs.
3. The free-choice programme may contain a short individual assignment of 10 or 15 ECs.
4. The examination board may decide not to grant permission if the proposed programme contains both units referred to in paragraphs 2 and 3.
5. With the exception of a practical exercise, a unit of the free-choice programme should have a scope of 3 ECs or more, but no more than 10 ECs.

Article 4.5 Validity of regulations

1. The regulations apply to the programme to which the unit usually belongs, as regards the following matters: examination periods, frequency of examinations, prerequisite knowledge for course units, type of examination and presentation of assessments.
2. If the regulations are contradictory or lead to insurmountable problems for the student, the examination board in charge of granting permission may permit deviations from the regulations.
3. Units which, in accordance with paragraph 1, must be successfully completed before the student can be admitted to units which form part of the free-choice programme need not form part of the free-choice programme themselves.
4. In view of the possible conditions for completing the individual research assignment, as referred to in Article 4.3, paragraph 3, or the Master's graduation project, as referred to in Article 4.3, paragraph 1, which means that it is difficult to establish a clear picture of these at the moment when the request for permission is made, the examination board will not withhold permission simply on the grounds that the programme contains a number of units which have yet to be determined, up to a maximum total of 10 ECs.
5. In exceptional cases, the examiner of a unit of study may waive the requirement that a particular unit can only be completed on condition that another unit has first been successfully completed.

Article 4.6 The sequence in which units are taken

1. An individual who submits a request for permission to take a free-choice programme that he himself has composed, must state the order in which the units are to be taken when making this request.

2. The examination board that is charged with the task of granting permission may decide that the units must be taken in a sequence other than that specified by the individual who submitted the request.
3. a. The examination board that grants permission may determine that the student is only permitted to take certain units specified by name once they have completed other units specified by name.
 - b. Students may only start the Master's graduation project under the following conditions:
 - if the free-choice programme contains a unit corresponding to or largely corresponding to the business internship, this unit must have been completed successfullyand
 - a number of units with a joint scope of 60 ECs or more have been successfully completed.
 - c. The chair under whose responsibility a particular individual research assignment or Master's graduation project is carried out may, in addition to the stipulations in subsections a and b and based on the nature of the assignment, demand that a student successfully complete a number of units specified by name with a total maximum scope of 10 ECs before being permitted to start the assignment/project.

CHAPTER 5 FINAL SECTION AND IMPLEMENTING PROVISIONS

Article 5.1 Implementing and amending these regulations.

1. Amendments to these regulations shall be approved by the dean in a separate decision and stated in Article 5.2, paragraph 2.
2. Amendments to regulations and prescriptions stated elsewhere but relating to these regulations shall also be approved by the dean, or by the programme director within his area of authority, in a separate decision and stated in Article 5.2, paragraph 2.
3. No amendments shall be introduced which apply to the current academic year unless they can reasonably be supposed to have no adverse effects on the interests of the students (including non-degree students). Where possible, amendments shall be announced six months before they come into force.
4. The replacement of the old regulations and amendments to these new regulations may furthermore not disadvantage students (including non-degree students) with regard to:
 - the validity determined by the examination board
 - the examination board's approval of a free-choice programme drawn up by a student or non-degree student
 - any other decision taken by the examination board in accordance with these or previous regulations in relation to a student or non-degree student.
5. In amending these regulations or amending rules or prescriptions stated elsewhere which relate to these regulations, transitional regulations will be drawn up if necessary. These transitional regulations will, in any case determine the circumstances in and/or period during which recourse can still be made to the original regulations.

Article 5.2 Date of commencement

1. The date of commencement of these regulations is 1 September 2011.
2. The amendments referred to in Article 5.1, paragraph 2 and paragraph 3, recorded in the decisions made by the dean and stated below with regard to the articles specified alongside, will come into effect on the dates stated.

Decision	Article	Date	Explanation	Date of Commencement
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3. For the implementation of these regulations, a transitional regulation has been drawn up and attached as Appendix A.

Article 5.3 Publication

The programme director will ensure that these regulations are published, along with any amendments to the rules, guidelines and instructions given or drawn up by the examination board in accordance with Article 7.12 of the Act.

Article 5.4 Short title for the purposes of citation

These regulations are the Teaching and Examination Regulations as referred to in Article 7.13 of the Act and can be cited as the “Master's TER for EE and MT”.

APPENDIX A TRANSITIONAL ARRANGEMENTS 09/10

At the implementation of these regulations in the 09/10 academic year, the validity of assessments was set at 6 years. In the previous regulations, there were no time limits on validity. The following transitional arrangements apply.

1. Assessments which were valid on 31 August 2009 retain their validity up to and including 31 August 2015.
2. Assessments which were obtained on or later than 1 September 2009 are valid for 6 years from the moment at which the unit of study in question was completed.

Appendix B The aims and final attainment targets of the Master's programme in Electrical Engineering

GOALS AND LEARNING OUTCOMES

The general goal of the ~~M~~master's programme is to train students to obtain the degree of Master of Science in Electrical Engineering.

The Department of Electrical Engineering aims to train ~~M~~master's students in a spectrum of professional and personal competencies to enable them, through analysis and research, to expand their knowledge and methodology in design, ~~through analysis and research~~, of innovative systems in a specific discipline.

The five fields of specialization are Biomedical Systems, Embedded System Design, Measurement and Control Engineering, Microsystems and Microelectronics, and Telecommunication Networks.

There is only one ~~master's~~ Master's programme in Electrical Engineering and the field of specialization determines the contents of the programme. In this way This structure ensures that graduates ~~maintain obtain~~ a broad Electrical Engineering qualification while ~~being~~ specializing in one ~~of the~~ specific fields. The graduate's chosen fields of specialization ~~are is~~ indicated on the degree ~~diplomacertificate~~.

The level of Master of Science in Electrical Engineering is ~~illustrated defined in by~~ the following general competencies:

- ~~A A student is only admitted to the M~~master's programme if he/she ~~has has~~ the competencies of a ~~B~~bachelor's graduate in Electrical Engineering ~~of at~~ the University of Twente. Students admitted to the programme from other higher education in case students are admitted from other programmes must make up for any with essential essential deficiencies in their competencies, for example by taking additional courses, these should be repaired. These Bachelor-level competencies are expanded on in the ~~M~~master's programme.
- A ~~m~~Master's graduate has specialized advanced knowledge in at least one of the areas of Electrical Engineering: Biomedical Systems, Embedded System Design, Measurement and Control Engineering, Microsystems and Microelectronics, ~~and or~~ Telecommunication Networks.
- A Master's graduate master has experience ~~in of~~ working in industry-related projects and has acquired the ability to function be effectively in a multidisciplinary environment.
- A Master's graduate master is innovative and able to work at the frontier of research and design, ~~and is innovative~~, contributing to breaking advance the frontiers of current technology or understanding.
- He/she defines his/her own design/research goals within the limits of his/her project, judges which parts of the problem need further analysis, carries out these analyses ~~on at an~~ abstract level, proposes experiments and carries them out in a methodologically correct way.
- A ~~m~~Master's graduate has a general understanding of is able to understand, on a general level, areas adjacent to his/her own area of specialization and is able to use

this understanding in the context of his/her own work. He/she is able to identify and appreciate new knowledge of/in other disciplines (if necessary also of/including non-technical areas where necessary) and to integrate this-it in his/her work.

- A Master's graduate is able to master can carry responsibility as a leading member of a multidisciplinary design (or research/development) group. He/she has and develops a broad perspective encompassing factors such as scope, e.g., with respect to the economical aspects of his/her work, and/or the impact of technological innovation on society. He/she is a serious partner in discussions on aspects about regarding the setting and societal environment of his/her work.

Compared to graduates at the baccalaureate level, a Master's graduate has more specialized knowledge and abilities, more-greater industrial experience and the has skills to independently solve relatively complex problems.

The learning outcomes of the Master's of Science programme in Electrical Engineering are mentioned-stated below.

A graduate of the Master's programme

Domain

1. has-been is specialized in one of the following five fields:

- Biomedical Systems
- Embedded System Design
- Measurement and Control Engineering
- Microsystems and Microelectronics
- Telecommunication Networks

and has-possesses knowledge and understanding thereof of one of these fields at on the a level corresponding to leading internationally recognized leading textbooks.

2. has acquired first-hand knowledge and is is able to apply it use-acquired front line knowledge theoretically and practically in research and design within either one of the following topics within the fields of specialization:

- Biomedical Systems
 - neurotechnology
 - biomechanics
 - lab-on-a-cChip for biomedical applications.
- Embedded System Design
 - integrated circuits and systems for mixed signals
 - energy-efficient and/or fault-tolerant and dependable (networked embedded) systems
 - embedded control system for robotics
 - advanced signal processing for embedded systems
- Measurement and Control Engineering
 - mechatronic systems using intelligent control systems with application areas in humanoid robots and for medical purposes
 - measurement and analysis systems for environmental and biomedical applications using computer imaging and biometrics
- Microsystems and Microelectronics
 - silicon technology in integrated circuits processing

- device characterization and reliability
- device physics and modelling
- integrated ~~analog~~analogue circuits in CMOS technology
- ~~the~~ exploration, development and fabrication of nanoscale electronic and spintronic devices
- micro/nanoscale integrated optical devices for applications in optical sensing and communication
- methods for fault detection and fault-tolerant chip architectures
- device physics, system- and device simulation and fabrication technology of nano-, micro-, and miniature mechanical devices for the application themes: sensors, actuators or fluid handling systems
- miniaturized ~~I~~Lab-on-a-~~c~~Chip systems for biomedical and environmental applications
- integrated high-frequency and microwave circuits for transceivers for wireless and wireline communication systems and radar.
- Telecommunication Networks
 - dependable networked communication systems; ~~as well as~~ methods and techniques to support the design of such systems
 - communication and signal processing systems ~~for the~~to extraction of information from narrowband or broadband signals such as from the ~~acoustical~~ domain
 - systems for ~~s~~Short-~~r~~Range radio
 - radio frequency photonics and electromagnetic compatibility
 - transmitters and receivers for wireless and wireline communication systems in CMOS technology.

Method

3. ~~can is able to~~ independently design a system starting from a general design problem, identify its required main function, partition this function in sub-functions, find systems to fulfil these functions, judge which of the possible alternatives is best suited to ultimately accomplish~~ing~~ the main function, thus solving the design problem.
4. is able to define his/her own design or research goals within the limits of a project, ~~can to~~ judge which parts need further analysis and modelling, ~~can to~~ carry these out on an abstract level, ~~will to~~ propose experiments if required and ~~to carry~~yies them out in a methodologically correct way.
5. is able to work at the front-line of ~~leading~~cutting-edge research and design ~~of within~~ his/her specialization, and ~~can to~~ contribute to ~~breaking~~advancing the frontiers of current technology and/or understanding.
6. ~~can is able to~~ independently acquire new knowledge and skills,; ~~to~~ reflect on trends, ~~responsibilities and roles~~ in his/her field of study, ~~on responsibilities and roles~~, and ~~to~~ use this insight as a guide for his/~~her~~ own personal development
7. ~~can is able to~~ plan, manage and document a research or design process, ~~to~~ reports its results in ~~both written and oral form, writing and verbally~~; ~~to~~ critically assess ~~these results~~ and ~~to~~ participate ~~effectively~~ in ~~relevant~~ debates ~~regarding these results~~.
8. is able to acquire new information relevant to his/her field of study from international scientific literature and other sources and ~~to~~ critically assess its value.
9. is able to work in an industry-related, multidisciplinary environment.

Context

10. ~~has a general understanding of areas adjacent to his/her own area of specialization and is able to use this understanding in the context of his/her own work. is able to understand, on a general level, areas adjacent to his/her own area of specialization~~

~~and can use this understanding in the context of his/her own work. He/she is able to identify and appreciate new knowledge in other disciplines including non-technical areas and to integrate it in his/her work. He/she is able to appreciate new knowledge of other disciplines, even of non-technical areas, and to integrate this in his/her work.~~

11. ~~is able to can~~ carry responsibility as a leading member a of multidisciplinary, possibly international design or research group and ~~can to~~ take into account the ethical, social and economical aspects of his/her work or the impact of technological innovation on society ~~into account~~.
12. is able to ~~properly orientate position~~ himself/herself ~~effectively to for~~ finding a suitable job.