

**Guidelines concerning Education and Examination Regulations**  
(pursuant to Articles 7.13 and 7.59 of the Dutch Higher Education and Scientific  
Research Act, WHW)  
for  
**Bachelor's degree programmes at the University of Twente (UT)**  
together with the  
**Education and Examination Regulations**  
for the  
**Bachelor's degree programme in Electrical Engineering at UT**

**The Dean of the Faculty of Electrical Engineering, Mathematics and Computer Science,**  
*having regard to* Articles 9.5, 9.15, paragraph 1, under a, 7.13, paragraphs 1 and 2, 9.38, under b, and  
9.18, paragraph 1, under a, and 7.59 of the *Wet op het hoger onderwijs en wetenschappelijk onderzoek*  
(Dutch Higher Education and Scientific Research Act, WHW),

*having heard* the opinion of the Programme Committee and the approval and opinion of the Faculty  
Council concerning the content of the programme-specific appendix in question<sup>1</sup>

**has decided to approve** the Education and Examination Regulations of the:

**Bachelor's degree programme in Electrical Engineering**

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<sup>1</sup> The advisory powers are derived from the provisions of subsections a – g of Article 7.13 of the WHW, while the right of approval is derived from the provisions of the remaining parts of Article 7.13 of the WHW.

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## **Preamble: Applicability**

1. For each degree programme, there is an appendix giving details specific to that programme, known as the programme-specific appendix.
2. The present general section together with the programme-specific appendix form the Education and Examination Regulations for the Bachelor's degree programme in question.
3. The general section and the programme-specific appendix of the Education and Examination Regulations are approved by the Dean of the Faculty in question.
4. The Education and Examination Regulations apply to all students enrolled for the degree programme in question.
5. The Examination Board of a degree programme shall draw up rules governing the performance of its tasks and its powers in accordance with the provisions of Article 7.12b of the Act.
6. The legal powers of the Examination Board of a degree programme apply to all components of the degree programme followed by the student.
7. The provisions of this general section of the Education and Examination Regulations, of the programme-specific appendix to the Education and Examination Regulations and of the Rules for the Examination Board also apply to parts of the degree programme provided by teaching staff from outside the department or from outside the University of Twente.
8. English translations of this general section of the Education and Examination Regulations, the programme-specific appendix to the Education and Examination Regulations and the Rules for the Examination Board are available for English-language Bachelor's degree programmes. In case of conflicts between the two texts, the Dutch text shall have priority over the English text.
9. References to 'the student', 'the teacher or lecturer', 'he', 'him' or 'his' in these Regulations shall be understood to refer to males as well as to females.

## Section 1 General

### Article 1 Definitions

The terms used in these Regulations that occur in the Dutch Higher Education and Scientific Research Act (*Wet op het hoger onderwijs en wetenschappelijk onderzoek*, WHW) shall have the significance given to them in the Act.

The following definitions apply to these Regulations:

Binding recommendation on continuation of studies (BSA):	a binding recommendation as referred to in Article 7.8b, paragraph 3 of the Act, made by the Examination Board on behalf of the Executive Board of the University, that the student named should be removed from the enrolment list of the degree programme in question.
EB:	Executive Board of the University of Twente.
Dean:	Head of the Faculty.
Credit (EC):	European Credit representing a study load of 28 hours, as referred to in the Act.
ECTS:	European Credits Transfer System: A set of European agreements concerning the system used to express students' study loads; the study load for one academic year amounts to 60 credits or 1680 hours (Art. 7.4 WHW);
Final degree assessment:	A student shall be allowed to proceed to the final degree assessment if he has passed all examinations for the degree programme in question or for the foundation year of the degree programme in question.
Examination Board:	The examination board for the degree programme, appointed by the Dean in accordance with Article 7.12a of the Act,
Examiner:	The person appointed by the Examination Board to supervise examinations, in accordance with the provisions of Article 7.12c of the Act.
Examination Programme:	The specific content of units of study recorded in the Student Information System (SIS) that an individual student has to be examined on in the course of his studies, including any optional or elective components.
Authorized Proof of Results:	A list or other written record of results initialled by or on behalf of an examiner, or results published in the Student Information System (SIS) that is currently in use.
Institution:	University of Twente,
Unit of study:	A component of a degree programme as referred to in Article 7.3, paragraphs 2 and 3, of the Act.
Degree Programme:	The curriculum of the course of study laid down in the programme-specific appendix.
Programme:	The course of studies leading to a Bachelor's degree as referred to in the programme-specific appendix of the Education and Examination Regulations.
Programme Director:	The person appointed by the Dean to manage the degree programme.
Practical exercise:	A practical exercise, as referred to in Article 7.13 paragraph 2d of the Act, is a unit of study or part of a unit of study focused on activity of the student himself, such as: <ol style="list-style-type: none"><li>1. carrying out a literature search, an assignment or a preliminary design, writing a thesis, article or position paper, or giving a public presentation;</li><li>2. carrying out a design or research assignment, performing tests and experiments, participating in practicals, practising skills;</li><li>3. doing an internship, taking part in field work or an excursion;</li><li>4. participating in other educational activities that are deemed necessary and are aimed at acquisition of the appropriate skills.</li></ol>
Student:	A person who is enrolled as such for a programme in accordance with Articles 7.34 and 7.37 of the WHW.
Student Information System:	The application designated by the Executive Board of the Institution for registration and providing information about all relevant data on students and studies, as referred to in the Act.
Student Counsellor:	A person appointed by the Executive Board of the Institution to act as an intermediary between students and the programme, as referred to in Article 7.34 paragraph 1d of the WHW.
Study Advisor:	A person appointed by the Dean of the Faculty to act as an intermediary

	between students and the programme, and to represent the interests of the students and play an advisory role in this capacity.
Academic year:	The period between 1 September of one year and 31 August of the following year. The academic year represents 60 credits or 1680 hours.
Study Plan	A plan drawn up by each student describing his intended progress through the degree programme.
Study Rate:	Number of credits achieved in a certain period divided by the number of credits that can nominally be achieved in that period.
Examination:	Assessment of the knowledge, insights and skills of the student at the end of the degree programme, together with evaluation of the results of that assessment.
UT:	University of Twente.
Working day:	Any day from Monday to Friday with the exception of recognized public holidays and the prearranged compulsory holidays instituted by UT.
Act:	Higher Education and Scientific Research Act ( <i>Wet op het hoger onderwijs en wetenschappelijk onderzoek</i> , abbreviated WHW in Dutch), published in the Official Gazette 1992 593 and as since amended.

## **Article 2 Content of the programme**

The programme-specific appendix covers at least the items referred to in Article 7.13, paragraph 2, under a - j, l, s and t of the Act.

## **Article 3 Attainment targets of the programme**

The objectives and attainment targets (Art. 7.13 paragraph 2c of the WHW) of each programme are given in the programme-specific appendix.

## **Article 4 Admission to the programme**

1. Admission is granted to the programme if one of the requirements with regard to prior education for enrolment in university education as laid down in the Act are met (see Article 7.24 for prior education requirements, Article 7.25 for additional entry requirements, Article 7.28 for exemption on the basis of other diplomas and Article 7.29 for exemption on the basis of admission tests).
2. Further details concerning admission tests are given in the latest version of the document entitled "Entrance Examinations and other arrangements for admission to Bachelor's programmes" (*Colloquium Doctum en andere toelatingsregelingen voor toelating tot bacheloropleidingen*). This document can be found on the University of Twente's website.

## **Article 4a Language**

1. Bachelor's programmes are in principle taught in Dutch in accordance with the University of Twente's Code of Conduct for Working Languages (*Gedragscode Voertalen*) and in accordance with Article 7.2 of the Act.
2. Another language may be used for teaching purposes in a Bachelor's programme with the permission of the Programme Director if:
  - a. the teaching in question concerns a guest lecture by a non-Dutch-speaking lecturer, or
  - b. the specific nature, design or quality of the curriculum, or the origin of the students, demands it.
3. If neither the Examiner nor the student objects, examinations can be taken in a different language.
4. Programme-specific supplements to the provisions of this article and ways in which it can be guaranteed that an English-language programme meets the requirements of the above-mentioned Code of Conduct for Working Languages, are laid down in the programme appendix and/or the Rules of the Examination Board.

## **Section 2 Student guidance**

### **Article 5 Study plan**

1. Each student is required to submit a study plan for a semester before the start of that semester. The deadline for submitting the study plan and the required format are communicated to the student by the Dean in due time.
2. The staff responsible for a programme shall determine the student's study plan for the first semester of the first academic year. This study plan shall specify all units of study to be taken during the first semester of the first academic year of the programme. In exceptional circumstances, the student may change this study plan in consultation with his Student Advisor.
3. The student may change their study plan in consultation with his Student Advisor after the deadline mentioned in the second sentence of paragraph 1 above.
4. A student may receive advice about the study plan he has submitted if the Student Advisor deems this necessary.
5. Further details of the method used by the Student Advisor to advise students about the study plans they have submitted will be announced by the Programme Director before the start of the academic year.

### **Article 6 Student supervision**

1. The Dean is responsible for student supervision, which includes informing the student of study opportunities within and outside the programme. The Dean has delegated the tasks involved in student supervision to the Programme Director.
2. A Student Advisor is assigned to each student.
3. The Student Advisor supervises the student and offers advice on study-related matters, as well as on personal problems if the student so desires. The Student Advisor also advises the student on facilities for specialized supervision within and outside the university.
4. If a student wishes to make use of his right to specific supervision or facilities, he must consult the Student Advisor. The Student Advisor records the agreements made with the student in the SIS, which may form the basis for rights accruing to the student.  
The following rules apply to special facilities:
  - a) Students who fall behind in their studies through demonstrable circumstances beyond their control or personal circumstances have the right to request extra supervision or facilities.
  - b) The right to the aforementioned supervision or facilities includes the right to additional individual student supervision, dispensation from participation in programme components and/or the use of special facilities, if necessary and possible. However, such dispensation and extra resits can only be granted by the Examination Board.

### **Article 6a First-year recommendation on continuation of studies**

1. Each student receives a written recommendation on the continuation of his studies within or outside the programme at the end of his first year of enrolment for the programme.
2. The recommendation referred to in paragraph 1 will comprise a binding recommendation to discontinue studies if the student achieved fewer than 45 credits in the first year. Any additional requirements are given in the programme-specific appendix.
3. The form and content of the binding recommendation are laid down in the Binding Recommendation on Continuation of Studies Directive at the University of Twente (*Richtlijn bindend studieadvies Universiteit Twente*).
4. The Examination Board is mandated by the Executive Board of the University to discontinue the student's studies based on this binding recommendation.
5. A binding recommendation on continuation of studies applies only to the programme for which the student is enrolled.

6. A student can request a verbal explanation of his recommendation and/or information on the possibilities of continuing his studies within or outside the programme or any other opportunities for further education.

## **Article 7 Studying with a disability**

1. A disability is any protracted physical, sensory or other functional disorder that might limit the student's academic progress.
2. The extra facilities considered most effective for the student in question are discussed in an interview with the Student Advisor. The extra facilities shall be chosen with the aim of safeguarding the student's achievement of the attainment targets.
3. The student shall submit a written application for provision of the necessary facilities in consultation with the Student Advisor and on the basis of the interview mentioned in paragraph 2.
4. The application shall be submitted to the Dean of the faculty, preferably three months before the student is due to participate in classes, examinations or practical exercises for which the facilities are required.
5. The application shall be supported by appropriate documentary evidence (such as a letter from a doctor or a psychologist or, in the case of dyslexia for example, a report by a testing bureau registered with BIG (Individual Healthcare Professions), NIP (Dutch Institute of Psychologists) or NVO (Dutch Association of Educationalists)).
6. The Dean of the faculty shall decide within 20 working days of receipt of the application mentioned in paragraph 3, or earlier if the urgency of the application requires this, whether the application should be granted, and shall inform the student and the Student Advisor of this decision.
7. The Student Advisor shall ensure that the relevant parties are informed in due time of the facilities granted to the student with a disability.
8. If the Dean of the faculty turns down the application in full or in part, he shall inform the student of the reasons for his decision and the possibilities of objecting to or appealing against it. An objection or appeal must be submitted in writing to the Objections, Appeals and Complaints Desk of Student Services within six weeks of the notice of the decision.
9. If the extra facilities are granted, the period for which this grant applies shall be stated. The applicant and the Student Advisor shall evaluate the facilities before the end of this period. This evaluation shall include a discussion of the effectiveness of the facilities provided and whether they need to be continued.

## **Section 3 Examinations**

### **Article 8 Frequency, timing, registration and deregistration**

1. There shall be an opportunity to sit written and oral examinations at least twice a year, and practical exercises at least once a year.
2. There shall be at least one opportunity to sit an examination at the end of the period in which the applicable unit of study was taught.
3. A student who fails to achieve a grade of 6 or higher in an examination for a given unit of study after two attempts and who still wishes to achieve such a grade must apply to the Examination Board for permission to resit the examination. This application must be accompanied by a plan of action drawn up by the student in consultation with the Student Advisor. The Examination Board decides whether or not to grant the application.
4. Further details of the arrangement described in paragraph 3 shall be announced by the Programme Director before the start of the academic year.
5. Contrary to the provisions of paragraph 1, an opportunity to take an examination for a unit of study that is part of the degree programme but has not been taught during a particular academic year shall be offered at least once in each academic year.
6. The Examination Board may in special cases allow a departure from the predetermined number of times and the manner in which examinations can be held.
7. A timetable giving the dates and times of all examinations held in a given semester shall be published at least one month before the start of the semester.
8. The Programme Director must approve any changes to the examination timetable. Students will be informed of all changes. The Programme Director must inform the Examination Board of the decision to make these changes during the next meeting of the Board.
9. Students are required to register for written examinations via SIS.
10. Students who have failed to register for a test or examination before the close of the registration period lose the right to sit that particular test or examination.
11. Students may withdraw from an examination up to and including the day before the examination in question.
12. A student who fails to appear for an examination for which he has registered via SIS and from which he has not withdrawn in time in accordance with the provisions of paragraph 11 shall be considered to have failed the examination, and this will be recorded in SIS as an unsuccessful attempt as referred to in paragraph 3.

### **Article 8a Types of examinations and information about examinations**

1. An examination shall be held at the end of each unit of study.  
An examination may have the following forms:
  - a written test,
  - an oral test,
  - a series of tests,
  - the assessment of practical exercises as referred to in Article 1;
  - a combination of the above.
2. The responsible member of teaching staff shall publish the following information at least two weeks before the start of the teaching period:
  - the examination requirements (in any case the subject matter to be tested);
  - further details of the method of holding examinations;
  - in the case of a series or combination of examinations as referred to in the previous paragraph, the weighting of each examination for the purposes of determining the final result.



3. The information referred to in paragraph 2 is any case published in the electronic learning environment (Blackboard) for the unit of study in question.
4. Students have the right to view model examination questions, practice examinations or representative old examination papers together with the relevant answers, and to be informed of the assessment standards for the examination in question.

### **Article 9 Oral examinations**

1. Oral examinations are held in public, unless the Examination Board decides otherwise in exceptional cases.
2. A student or Examiner who wishes specific third parties to be present during an oral examination must inform the Examination Board of this at least 10 working days before the examination in question.
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 examination, this is made known to the Examiner and the student at least one working day before the examination.

### **Article 10 Period of validity of examinations**

1. The results obtained for a successfully completed unit of study remain valid for six years.
2. A student can submit a request to the Examination Board to have the period of validity of the results referred to in paragraph 1 extended. The Examination Board may not refuse this request without a valid reason. If the Examination Board turns down this request, it shall inform the student of the reasons for this decision in writing.
3. The results of examinations that form part of a series or combination of tests are valid only during the academic year in which they were achieved. The Examiner for the unit of study in question may decide on an alternative arrangement. In this case, the Examiner shall inform the Examination Board, and details of the alternative arrangement shall be published on the electronic learning environment (Blackboard).

### **Article 11 Determination and publication of the results**

1. The results of a written examination or practical exercise are made known to the student in question via SIS within 20 working days of the date on which he sat the examination or the practical exercise was completed.
2. The results of an oral examination are 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 examination forms part of a series of oral tests relating to the same unit of study, which take place on more than one day. In that case, the Examiner shall determine the results within one working day of the conclusion of the series of oral tests.
4. If the results for a unit of study are based on the completion of one or more assignments, papers or theses, then the date of submission of the final assignment, paper or thesis shall count as the examination date.
5. If the Examiner is unable to meet the deadlines referred to in paragraphs 1 and 2 due to exceptional circumstances, he shall inform the Examination Board and state the reasons for the delay. The Examination Board shall inform the student in question of the delay and of the new date on which the results are to be announced as soon as possible. If the Examination Board is of the opinion that the Examiner had failed to perform his task to their satisfaction, it may appoint another Examiner to mark the examination.
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 before the second examination, in order to give students time to prepare for the second opportunity.
7. A student can obtain a certified study progress overview from the Student Services Desk if he so desires.

8. If a student receives more than one authorized result for one and the same unit of study, the highest result shall apply.

### **Article 12 Students' right to inspect and discuss marking**

1. The student has the right to discuss the marking of an examination, including a statement of the grades given by the Examiner. If no group discussion of the results is held, the student may submit a request to the Examiner within two weeks of the publication of the examination results for an individual discussion of the results. This discussion, or a group discussion, must be held within five weeks of the publication of the examination results. After this term of five weeks, the student shall no longer have the right to discuss the results of an examination and to hear the Examiner's reasons for the grades given.
2. The examiner responsible for the assessment of a student's written examination shall also ensure that the marked examination papers are 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 the marked examination papers during this period.
3. The Examination Board may permit deviations from the provisions of paragraphs 1 and 2.

### **Article 13 Administrative errors and omissions**

If an apparent error is discovered following the publication of an examination result, a transcript or the overview of a student's progress, both the department and the student concerned are obliged to make this error known to the other party immediately after it has been discovered and to work together to correct it.

### **Article 14 Exemption from an examination or practical exercise**

1. The Examination Board may grant a student exemption from an examination or practical exercise at the student's request, if necessary after having consulted the Examiner in question.
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, insights and skills acquired by the student outside 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, is likely to face them with a moral dilemma. In such a case the Examination Board shall decide whether the practical exercise or assignment can be carried out in another manner to be determined by it.

## **Section 4 Final degree assessments**

### **Article 15 Flexible programme**

The Examination Board for the programme decides whether to accede to a request for permission to follow a flexible degree programme as referred to in Art. 7.3d of the Act. The Examination Board shall check whether the flexible programme falls within the domain of the degree programme, is coherent and has an adequate level in view of the attainment targets set for the degree programme.

### **Article 16 Final assessments associated with the degree programme**

1. The programme has a final assessment after the first year and a final assessment for the Bachelor's degree.
2. The first year of the programme is known as the foundation year and has a study load of 60 credits.
3. The Bachelor's programme has a study load of 180 credits. It consists of a foundation year with a study load of 60 credits and a second and third year, each with a study load of 60 credits.

### **Article 17 Timing of final assessment and issuing of degree certificates**

1. In accordance with Article 7.10, paragraph 2 of the WHW, the final assessment for the foundation year or the Bachelor's programme is deemed to have been successfully completed if the student in question has passed all the examinations for the foundation year or the Bachelor's programme.
2. The Examination Board declares the student to have successfully completed the foundation year or Bachelor's degree assessment if he meets the examination requirements, and invites the student to attend the graduation ceremony where he is presented with the appropriate degree certificate and transcript or supplement. The date recorded on the certificate – the examination date – is the date on which the student successfully completed the last remaining unit of study.
3. A student may make a written request (stating the reasons) to the Examination Board to postpone declaring the final assessment as 'successfully completed' and also to postpone the presentation of the certificate. The student must indicate the desired length of postponement in this request.
4. The procedure for handling requests of the type mentioned in paragraph 3 shall be included in the Rules for the Examination Board.
5. If the student has requested postponement on the basis of paragraph 3, the examination date shall be the date following the postponement on which the Examination Board has decided to declare the student to have successfully completed the final assessment.

### **Article 18 Degree**

Students who have successfully met all requirements for the final Bachelor's degree assessment are awarded a Bachelor of Science (BSc) degree.

## **Section 5 Appeals and Objections**

### **Article 19 Individual Appeals and Objections**

Appeals against decisions of the Examination Board or an Examiner, and objections to decisions made by the Dean on the basis of these Regulations, must be submitted in writing to the Objections, Appeals and Complaints Desk at Student Services within six weeks of notice of the decision.

## **Section 6      Inconsistencies, Amendments and Implementation**

### **Article 20 Provisions that conflict with these Regulations**

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

### **Article 21 Amendments to the Regulations**

1. Amendments to these Education and Examination Regulations are adopted by the Dean in a separate decree.
2. In principle, amendments to these Regulations shall not apply to the current academic year. However, amendments to these Regulations may apply to the current academic year if students' interests are not prejudiced within reasonable limits, or in situations of force majeure.
3. Amendments to these Regulations have no effect on earlier decisions of the Examination Board.

### **Article 22 Transitional arrangements**

1. If these Education and Examination Regulations are amended, the Dean shall if necessary adopt a transitional arrangement with a predetermined period of validity.
2. The transitional arrangement shall be published on the website of the degree programme in question.
3. The following principles shall apply to transitional arrangements made after amendment of a degree programme:
  - a) Changes to a degree programme are published before the start of the academic year in which they are to apply.
  - b) No guarantee can be given that all units of study stated to be part of a programme at the time a student enrolled for the programme will actually be taught in the programme. The degree programme as most recently approved by the Dean is taken as the basis for the final assessment of the foundation year and the Bachelor's degree programme as a whole.
4. The transitional arrangements shall at all events include:
  - a) details of which units of study that have been omitted are equivalent to which units of study, or parts thereof, in the amended degree programme as described in the programme-specific appendix;
  - b) a statement that if a unit of study that does not involve a practical exercise is omitted from a programme, then students shall be given two opportunities in the following academic year to take the relevant examination, either orally or in writing, or to undergo another form of assessment;
  - c) a statement that if a unit of study that involves practical exercises is omitted from a programme, and no opportunities are offered to carry out these practical exercises during that academic year, at least one unit of study shall be designated to replace the unit of study that has been omitted;
  - d) the period of validity of the transitional arrangements.
5. The provisions of Article 4 of a transitional arrangement must be approved by the Examination Board.
6. In exceptional cases, and if this is to the student's advantage, the Examination Board may allow a deviation from the number of times and the way in which examinations may be taken for a unit of study that has been omitted from the programme.

### **Article 22a      Review of the Education and Examination Regulations**

The Programme Director is authorized by the Dean to ensure a regular review of the Education and Examination Regulations, taking into account the resultant study load for students (modified, if necessary, as a result of the review).

In accordance with Article 9.18 of the WHW, the Programme Committee is responsible for issuing recommendations on the Education and Examination Regulations as well as performing an annual assessment of the implementation of the Education and Examination Regulations.

### **Article 23 Publication**

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

### **Article 24 Date of Commencement**

These Regulations take effect on 1 September 2012 and replace the Regulations dated 1 September 2011.

Approved by the Dean of the Faculty of Electrical Engineering, Mathematics and Computer Science, having regard to Articles 9.5, 9.15, paragraph 1, under a, 7.13, paragraphs 1 and 2, 9.38, under b, and 9.18, paragraph 1, under a, and 7.59 of the *Wet op het hoger onderwijs en wetenschappelijk onderzoek* (Dutch Higher Education and Scientific Research Act, WHW), having heard the opinion of the Programme Committee and the approval of the Faculty Council.  
Enschede, 3 July 2012.

**PROGRAMME-SPECIFIC PART  
OF THE EDUCATION AND  
EXAMINATION REGULATIONS  
FOR THE  
BACHELOR'S DEGREE  
PROGRAMME IN ELECTRICAL  
ENGINEERING**

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## Chapter A General provisions

### **Article A1      *Applicability***

The following regulations form the programme-specific part of the university-wide Education and Examination Regulations as referred to in Article 7.13 of the Act, and apply to the Bachelor's degree programme in Electrical Engineering, referred to from now on as "the programme".

### **Article A2      *Attainment targets of the programme***

The general attainment targets for graduates of the Bachelor's degree programme in Electrical Engineering are listed below.

A graduate is expected

#### **(Field)**

##### ***basic mathematic knowledge***

1. to know enough calculus to solve differential and integral equations, to be able to solve sets of linear equations and to perform probability and stochastic calculations in order to describe and/or model physical phenomena, components, signals and circuits.

##### ***basic physical knowledge***

2. to be able to describe simple electromagnetic and mechanical phenomena and the structure and operation of semiconductor components, and to analyse and model the collection of information required for the operation of physical systems.

##### ***electronics***

3. to be able to give a functional description of simple analog circuits, to perform an analytical study of such circuits and to extend the functional investigation to circuits of increasing complexity with the aid of numerical methods and simulations.

##### ***computer technology***

4. to be able to analyse and build simple digital circuits and to use a hardware description language to design more complex circuits; to be acquainted with the organization of a computer and its subsystems; and to solve a problem algorithmically with the aid of a computer language after analysis.

##### ***process control technology***

5. to be acquainted with the functionality and structure of a measuring system and to be able to identify and analyse measuring errors so as to handle measuring equipment effectively for the design and testing of circuits built during assignments and projects.
6. to be able to analyse and design physical systems that make use of control strategies, for example in electronic circuits and robotics.

### ***communication technology***

7. to be able to describe communication systems in terms of the media, modulation and coding techniques and protocols used, and hence to make a reasoned assessment of the performance and quality of such systems.

### **(Skills)**

8. to be able to divide the main function of a desired application into well chosen subsidiary functions, as a basis for a functional design of the application.
9. to be able to realize the subsidiary functions of a functional design of a desired application with the aid of subsystems in such a way that the finished system (the total of the subsystems) performs as desired, taking into consideration the requirements and conditions that have been set. He is also able to make a reasoned choice of the best system after evaluation of a number of alternative systems.
10. to be able to make oral and written reports of assignments and projects.
11. during assignments and projects, to be able to work well with teammates and the people who set the assignments and projects.
12. to be able to analyse the key problems involved in assignments and projects, to collect the necessary information, to draw up a research plan and to plan its implementation.
13. to be able to collect information through scientific literature searches, with or without the aid of automated search methods.
14. to be able to make a contribution to a scientific study or design in a restricted field.

### **(Context)**

15. to be able to select and participate in an appropriate Master's degree programme after completion of the Bachelor's programme, or to find a position outside the academic world.
16. to be able to analyse the technological and social consequences of recent developments in his field, and to discuss them with colleagues.
17. to be able to reach conclusions about his own discipline from the viewpoint of another branch of science with a wider perspective.

#### ***Article A3      Structure of the programme***

All students must follow the programme full-time.

#### ***Article A4      Scope of the programme***

The programme has a study load of 180 credits.

#### ***Article A 5 Language of the programme***

##### **A5.1**

1. The units of study of the first year of the programme will be taught in English with effect from the academic year 2012/13.
2. The units of study of the second year of the programme will be taught in English with effect from the academic year 2013/14.

3. The units of study of the third year of the programme will be taught in English with effect from the academic year 2014/15.

#### A5.2.

1. The examinations of the first year of the programme will be held in English in 2012/13.
2. The examinations of the second year of the programme will be held in English in 2013/14.
3. The examinations of the third year of the programme will be held in English in 2014/15.
4. Having regard to the University's Code of Conduct for Working Languages, the provisions of paragraphs 1 and 2 may be dispensed with, with the permission of the Examination Board.
5. Students do not need to know Dutch

#### A5.3

1. The working language of the Bachelor's degree programme in Electrical Engineering is English, in view of the specific nature of the subject and the origin of the students. This applies both to the teaching and to the assessment.
2. Examinations may be held in a language other than English, with the permission of the Examination Board.
3. Students from abroad must be able to demonstrate that they have an adequate command of English, both oral and written.
  - a. Students from countries that are signatories to the Treaty of Lisbon and who had English in their school-leaving examination meet this requirement.
  - b. German students with a secondary school diploma who took English up to and including their last year at school meet this requirement.
  - c. Students with another previous education may be required to pass a recognized test before being granted admission to the programme – for example, to get a total score of at least 6.0 in the IELTS test or at least 80 in the Internet-based TOEFL test. Students with a diploma from a country where English is the only official language of education are exempted from this language requirement.
4. The evaluation of the quality of teaching of the various subjects by means of questionnaires and panel interviews shall in all cases include a check on the teaching staff's command of English. If the results of the check indicate the need for this, the Programme Director shall instruct the members of teaching staff involved to take effective steps to improve their command of English.

### **Article A 6      Laptop**

Students should have a notebook (laptop) when they start their studies. After enrolment for the programme, the Central Student Administration will provide the Notebook Service Centre (NSC) of the University of Twente with the contact details of the students who have enrolled. The NSC will inform the future students of the possibilities of acquiring one of the notebooks selected by the NSC, and makes software available on its website that students can download. Students can use their notebook to link up to the University of Twente's wireless network, and thus to access the Internet and the University's intranet.

## Chapter B Various types of assessment and the degree programme

### **Article B1** *The final assessments and the various phases of the study*

1. The assessment at the end of the foundation year covers the subject matter taught in the foundation year as referred to in Article 7.8 of the Act.
2. Students may only take the final assessment for the Bachelor's degree programme if they have passed the final assessment for the foundation year or have been granted exemption from this assessment.
3. A student who has not yet passed the final assessment for the foundation year by the end of his second year at University and has gained less than 80 credits for the programme shall be excluded from further post-foundation-year units of study.
4. In exceptional circumstances, the Examination Board may grant a student exemption from the provisions of paragraph 3 at his request.

### **Article B2** *The content of the programme*

1. The foundation year consists of the following units of study, with the indicated study load in credits:
  - a) The modules:

IEEE (Introduction to Electrical and Electronic Engineering)	15 credits
Electric Circuits	15 credits
Electronics	15 credits
  - b) The subjects:

Theory of Electromagnetic fields	6.5 credits
Mathematics D1 Riemann	3 credits
Fundamentals of Digital Logic	5 credits
  - c) Practical training:

Electromagnetic fields Laboratory	0.5 credits
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2. The second and third years of the degree programme, as referred to in Article 7.30 of the Act, consist of the following units of study:
  - a. The subjects:

Linear Difference and Differential equations	5 credits
Probability	3 credits
Mechanics and Transduction technology	3 credits
Telematics Systems and Applications	4 credits
Measuring technology	4 credits
Linear systems	6 credits
Computer organization	3 credits
Computer Systems	5 credits
Dynamic Systems	3 credits
Control technology	4 credits
Semiconductor Devices	4 credits
Communication	1 credit
Introduction to Chairs	1 credit
Electrodynamics	4 credits
Introduction to Electrical Energy Technology	3 credits
Random Signals and Noise	4 credits

Embedded Signal Processing	6 credits
Basic Optical Functions and Microsystems	3 credits
Introduction to Communication Systems	3 credits
Minor	20 credits

b. Practical training:	
Mechatronics Project	4 credits
B2 project	11 credits
Materialization practical	1.5 credits
Final Bachelor's assignment	14.5 credits

### **Article B3      *Special features of the various units of study***

1. Projects form an integral part of all modules
2. Practicals form an integral part of all modules
3. A practical forms an integral part of the unit of study Computer Organization.
4. A practical forms an integral part of the unit of study Fundamentals of Digital Technology.
5. A practical forms an integral part of the unit of study Measuring Technology.
6. An elective practical may be taken in the unit of study Computer Systems.
7. A practical and a project form an integral part of the unit of study Embedded Signal Processing.
8. The examination for the Minor may be divided into parts.
9. Practical exercises referred to as "projects" in Article B2 are carried out by groups of students.

### **Article B4      *The procedure for examinations***

1. Modules will be assessed by means of interim examinations, which may be oral or written.
2. A single grade will be given for each module.
3. No examination is held for the unit of study "Introduction to Chairs".
4. The unit of study Electromagnetic Field Theory shall be assessed by an oral examination.
5. The units of study listed in Article B2 under the heading "The subjects" shall be assessed by a written examination, with the exception of the units of study mentioned in paragraphs 1 and 2 of the present article.
6. If a practical or a project forms an integral part of a unit of study as laid down in Article B3, no examination can be held for that unit of study until the practical or project has been successfully completed. However, the Examiner for the unit of study in question may allow the examination to be held before the practical or project has been completed, or before it has been successfully completed; but in that case the examination will not be marked until the practical or project has been successfully completed.
7. The Examiner may deviate from the provisions of paragraphs 1-6 in individual cases.
8. In the case of a Minor, the Education and Examination Regulations of the department teaching that Minor shall apply.

### **Article B5      *The procedure for the assessment of practical exercises***

1. Without prejudice to the provisions of paragraph 2, the Examiner of one of the practical exercises referred to in Articles B2 and B3 may require a logbook to be kept during the practical exercise and/or a report on part of the whole of the practical exercise to be submitted.
2. A report must be written and a presentation must be given on the activities involved in each of the units of study designated as the B2 project and the final Bachelor's assignment. The Examiners for these units of study may also require interim presentations to be given.
3. A student can only receive grades for a practical exercise if he has participated in that exercise.

4. A practical exercise is assessed on the basis of the performance shown during the exercise, and on the basis of the logbook, the report and/or the presentation on the exercise if they are demanded.

**Article B6**      **Prior knowledge requirements**

1. Students may only take the unit of study Mechatronics Project after they have taken the units of study Mechanics & Transduction Technology, Measuring Technology, Dynamic Systems and Control Technology and if they have demonstrated to the satisfaction of the Examiner for the project that they possess enough knowledge to be able to participate in the project with good results.
2. Students may only take the unit of study designated as the B2 project after they have completed units of study from the Bachelor's degree programme with a combined study load of 77 or more credits, and if they have passed the final assessment for the foundation year.
3. Students may only take the Minor after they have successfully completed units of study from the Bachelor's degree programme with a combined study load of 80 or more credits.
4. Students may only take the unit of study designated as the final Bachelor's assignment after they have successfully completed units of study from the Bachelor's degree programme with a combined study load of 88 or more credits, including the B2 project. The chair under whose authority the final Bachelor's assignment is performed may stipulate that certain units of study other than the B2 project should belong to the completed package of 88 credits.
5. The examiner for a unit of study for which prior knowledge is required shall check, before a student takes the examination for that unit of study or before he participates in that unit of study, that the prior knowledge requirement is satisfied. If this requirement is not satisfied, the Examiner may nevertheless permit the student to take the examination for that unit of study or to participate in that unit of study if the Examiner is satisfied that the student does possess sufficient prior knowledge to sit the examination or to participate in the unit of study with good results.

**Article B7**      **Sequence of units of study and examinations**

1. The sequence in which units of study can be followed and examinations can be taken, together with the periods during which the examinations can be taken, are given in the timetables.
2. a. Examiners may decide, at a student's request or for some other reason, that the examination for a certain unit of study can be held outside the periods referred to in paragraph 1 of this article.  
b. If the examiner for a unit of study decides that due to exceptional circumstances it is reasonable to offer an extra examination opportunity open to all students following that unit of study, he shall submit a request to this effect to the Examination Board; the Examination Board must consult the Programme Director before reaching a decision on this request.

**Article B8**      **The Minor**

1. A student who is enrolled for the Bachelor's degree programme in Electrical Engineering and who meets the admission requirements referred to in Article B6 paragraph 4 may take any minor offered by the University, with the exception of those minors listed in the 'Minor admission review' which the Examination Board has stated may not be chosen by the student. The Examination Board shall update the 'Minor admission overview' annually.
2. Further to the provisions of paragraph 1, a student may, with the permission of the Examination Board, put together a minor by combining his own selection of the units of study offered by any university. The Examination Board shall draw up guidelines for the approval of such requests.

### **Article B9**      **The final assignment**

1. When the prior knowledge requirements referred to in Article B6 paragraph 5 are met, the student may select a chair at any university as the site where he will carry out the final Bachelor's assignment. If the assignment is performed outside the department of Electrical Engineering of the University of Twente, the permission of the Programme Director is required.
2. The chair shall appoint a supervisory committee consisting of at least two persons. At least one of members of the supervisory committee shall be a tenured member of the academic staff of the department of Electrical Engineering at the University of Twente. The supervisory committee shall appoint an executive supervisor from amongst its members.
3. The supervisory committee shall include at least one examiner.
4.
  - a) The final Bachelor's assignment has a study load of 14.5 credits. Students and supervisors should reach agreement on the dates when the assignment is to begin and to end.
  - b) The student's performance in the assignment shall be assessed on the closing date, irrespective of the stage his work has reached.
  - c) If the grade for the assignment is below a pass grade, the chair may give the student the opportunity to continue working on the assignment so as to meet the requirements for a pass grade. The extra time allowed shall however be limited to a study load equivalent to 3 credits. The grade for the assignment may not exceed a 6 in this case.
  - d) If the student's performance is still unsatisfactory after extra time has been allowed, he will have to do a new assignment with another theme and another supervisory committee or under the authority of another chair.

## **Chapter C**      **Master's programmes following Bachelor's in Electrical Engineering**

### **Article C1**      **Master's programmes following Bachelor's in Electrical Engineering**

Students with a Bachelor's degree in Electrical Engineering from the University of Twente are entitled to take the following Master's degree programmes:

- the Master's degree programme in Electrical Engineering at Delft University of Technology and Eindhoven University of Technology
- the Master's degree programme in Mechatronics (which will soon only be available as a Major within the Master's degree programme in Systems and Control) at the University of Twente
- the Master's degree programme in Embedded Systems offered jointly by the University of Twente, Delft University of Technology and Eindhoven University of Technology.
- the Master's degree programme in Nanotechnology at the University of Twente

## **Chapter D**      **Free-choice Bachelor's degree programme**

### **Article D1**      **Relevant concepts**

1. The free-choice Bachelor's degree programme is a programme as referred to in Article 7.3c of the Act. A student can put such a programme together himself by selecting from the units of study offered by an institution. Since a diploma is also awarded for successful completion of a free-choice programme, the programme requires permission from the most relevant Examination Board.
2. When giving such permission, the Examination Board shall determine which degree programme the free-choice programme compiled by the students in question shall be deemed to belong to.

**Article D2**      **Permission of the Examination Board**

The Examination Board shall draw up guidelines for the granting of the permission referred to in Article D1, with the proviso that the free-choice degree programme must be coherent, must have a level comparable with that of the Bachelor's programme referred to in Chapter B and must meet the requirements stated in Article D3.

**Article D3**      **Examinations and structure of the free-choice Bachelor's degree programme**

1. The free-choice Bachelor's degree programme has an assessment at the end of the foundation year and a final assessment for the Bachelor's degree.
2. The assessment at the end of the foundation year covers the subject matter taught during the foundation year as referred to in Article 7.8 of the Act.
3. Students may only take the final assessment for the Bachelor's degree programme if they have passed the final assessment for the foundation year or have been granted exemption from this assessment.
4. A student who has not yet passed the final assessment for the foundation year by the end of his second year at the University and has gained less than 80 credits for the programme shall be excluded from further post-foundation-year units of study.
5. In exceptional circumstances, the Examination Board may grant a student exemption from the provisions of paragraph 4 at his request.
6. The free-choice Bachelor's degree programme must be followed full-time, and has a study load of 180 credits.

**Article D4**      **The composition of the free-choice Bachelor's degree programme**

1. The free-choice Bachelor's degree programme shall contain at least one component that is comparable with the final Bachelor's assignment referred to in Article B2. This component shall have a study load of at least 10 credits and no more than 20 credits.
2. The free-choice Bachelor's degree programme shall contain at least one component that is comparable with the B2 project referred to in Article B2. This component shall have a study load of at least 5 credits and no more than 15 credits, and must be performed by a group of students.

**Article D5**      **Validity of arrangements**

1. The regulations concerning the periods during which examinations can be taken and the frequency of the examinations, the prior knowledge requirements for the various units of study, the way in which examinations are held and the form in which the examination results are announced shall be the Education and Examination Regulations applying to the degree programme to which the unit of study in question normally belongs.
2. If the regulations conflict or lead to insuperable problems for students, the Examination Board may permit departures from the regulations.
3. Units of study that have to be successfully completed in accordance with the provisions of paragraph 1 before a student can proceed to units of study that form part of the free-choice degree programme need not necessarily belong to the free-choice degree programme themselves.
4. With reference to possible conditions for taking the unit of study referred to in Article D4 paragraph 1 where it is not yet clear whether the conditions are met or not at the moment when the request to follow the free-choice degree programme is made, the Examination Board charged with granting the permission shall not withhold its permission solely on the grounds that the programme contains one or two units of study with a study load of no more than 10 credits for which a description has not yet been given.



5. In exceptional circumstances, the examiner for a unit of study that must be successfully completed before another unit of study is started may decide that this condition may be waived.

**Article D6      *Sequence of the various parts of the free-choice Bachelor's degree programme***

1. Each student who has submitted a request for approval of a free-choice Bachelor's degree programme he has put together shall include in the request the sequence in which the various parts of the programme shall be taken.
2. The Examination Board charged with giving the approval may decide that certain parts of the programme shall be taken in another sequence than that specified by the applicant.
3.
  - a. In particular, the Examination Board charged with giving the approval may decide that certain named parts of the programme may not be taken until other named parts of the programme have been successfully completed.
  - b. The assignment referred to in Article D4 paragraph 1 may not be started until at least 88 credits of the free-choice Bachelor's degree programme, including the project referred to in Article D4 paragraph 2, have been successfully completed.
  - c. The chair under whose authority the unit of study referred to in Article D4 paragraph 1 is performed may determine, in addition to the provisions of a. and b. above, that if the content of the assignment demands this at most two named units of study with a study load of at most 10 credits shall be successfully completed before the assignment may be started.

**Chapter E Study Plan**

1. The Study Advisor is responsible for overseeing the drawing up of the study plan. The Study Advisor shall send students a digital study plan form, at a time that allows them at least 10 working days to fill it in. The completed form must be submitted by students no later than the last working day before the examination period of the second or the fourth quarter.
2. All first-year students are asked to amend the study plan before the start of each successive quarter of the first year. If students can demonstrate that they are making the expected progress in their studies, this requirement is a request rather than an obligation.
3. First-year students are asked to amend the study plan each quarter to take into account changes in the curriculum recorded in the supplement to the programme-specific appendix relating to Article 2.
4. The study plan is a standard item of discussion for first-year students in the talks they have with the Study Advisor. If the Study Advisor considers this to be necessary, he will send students a written comment on their study plan in the form of an e-mail message.  
In the case of second- and third-year students, the Study Advisor shall determine when, and to which students, he sends a comment on the study plan.  
If a student asks the Study Advisor for advice on his completed study plan, he will always receive a comment from the Study Advisor.
5. Most of the comments made by the Study Advisor on a student's study plan will be made orally, during the regular supervisory meetings with the student. In addition, written comments may be made on completed study plans. If a student asks for advice, a comment is always sent.  
*Third attempt at an examination:* a recently completed study plan must accompany each request made by a student to sit the examination for a given subject a third (or a further) time. The details given in the study plan may help the Examination Board to come to a decision about the request. The Study Advisor can also use this information as a basis for recommendations to the Examination Board concerning a request to sit an examination a third time.

*Binding recommendation on continuation of studies:* advice about the study plans submitted may not be used as evidence in procedures relating to binding recommendation on continuation of studies.

## **Chapter F      Final and introductory provisions**

### ***Article F1      Hardship clause***

If these Regulations give rise to evidently unfair or otherwise unintended consequences, the Programme Director or the Examination Board (depending on which is competent to deal with the issue in question) may authorize a departure from these Regulations.

### ***Article F2      Introduction and amendment of these Regulations***

1. Amendments to these Regulations are approved by the Dean in a separate decree, and recorded in Article F3 paragraph 2.
2. Amendments to arrangements and guidelines relating to these Regulations but formulated elsewhere are approved by the Dean in a separate decree, and recorded in Article F3 paragraph 2.
3. No amendment to these Regulations shall come into force during the current academic year, unless they can be reasonably assumed not to have any adverse effect on the interests of students (including external students). Amendments shall if possible be announced six months before they come into force.
4. The replacement of the old Regulations and the amendments introduced in these new Regulations shall further not adversely influence the interests of students (including external students) as regards:
  - the period of validity of the Regulations as determined by the Examination Board,
  - the approval by the Examination Board of a free-choice degree programme or a free-choice minor put together by students (including external students),
  - any other decision concerning students (including external students) taken by the Examination Board pursuant to these Regulations or the preceding Regulations.
5. When these Regulations or arrangements and guidelines relating to these Regulations but formulated elsewhere are amended, transitional arrangements shall be approved to determine in any case under what circumstances and/or during which period use can still be made of the original Regulations.

### ***Article F3      Date of commencement***

These Regulations come into force on 1 September 2012.

## **Appendix (i) Transitional arrangement for new Education and Examination Regulations for 2009/2010**

*New Education and Examination Regulations come into force on 1 September 2010. These consist of a part that applies to the University as a whole and a part that only applies to this programme.*

*One of the changes made is that assessments are no longer indefinitely valid but have a period of validity of 6 years.*

*Furthermore, the limitation placed on the number of examination attempts (Article 8 paragraph 3) makes a pronouncement necessary on how the number of attempts made before 1 September 2010 should be taken into account.*

*Transitional arrangements are required to cover these points.*

### **Article (i) 1 Period of validity**

1. Assessments that were valid on 31 August 2009 shall retain their validity up to and including 31 August 2015.
2. Assessments made on or after 1 September 2009 shall retain their validity for 6 years from the moment when the unit of study in question was completed.

### **Article (i) 2. Participation in second- and third-year units of study**

Expired.

### **Article (i) 3 Arrangement concerning unlimited right to resits**

Reason for transitional arrangement: amendment changing the situation for older cohorts of students.

Period of validity: unlimited.

1. For the purposes of the application of the provisions of Article 8 paragraph 3, all examination attempts for a unit of study made before 1 September 2010 are disregarded. A student who already has an examination result for a unit of study from before 1 September 2010 is still allowed two resits for that unit of study after 1 September 2010 without any restrictions. Thereafter, the restrictions referred to in Article 8 paragraph 3 shall apply to him.

## **Appendix (ii) Transitional arrangement for new Education and Examination Regulations for 2009/2010**

The student cohort entering the University in the academic year 2012/13 will be offered a new foundation year.

1. Examination opportunities for all units of study from the old curriculum will be offered in the academic year 2012/13.
2. Students who want to follow the old curriculum will be offered the following facilities:
  - a) Introduction to Electrical and Electronic Engineering - IEEE (191211580): the timetable of the IEEE module will indicate which units of study are equivalent to the old subject and should be followed
  - b) Introduction to object-oriented programming (192110174): the timetable of the IEEE module will indicate which units of study are equivalent to the old subject and should be followed
  - c) Calculus 1 (201000177): students should take Calculus 1 (201000175) or Calculus 1 (201000176)
  - d) Network Analysis (191210050): the timetable of the Electric Circuits module will indicate which units of study are equivalent to the old subject and should be followed
  - e) Basic Concepts in Digital Technology is retained in its old form
  - f) Measuring Instruments and Network Analysis Practical (192130014): the timetable of the Electric Circuits module will indicate which units of study are equivalent to the old subject and should be followed
  - g) IEEE Practical (191211600): the timetable of the IEEE module will indicate which units of study are equivalent to the old subject and should be followed
  - h) Basic Electronic Circuits (191211750): the timetable of the Electronics module will indicate which units of study are equivalent to the old subject and should be followed
  - i) Basic Electronic Circuits Practical (191211760): the timetable of the Electronics module will indicate which units of study are equivalent to the old subject and should be followed

- j) Calculus 2 (191511040) is equivalent to Mathematics D1 Riemann (201200165) in the 4th quarter
- k) Linear structures (191510103 ) is equivalent to Linear Algebra (191521650 or 201000181).
- l) Mid-foundation-year project: not applicable
- m) Electronic Functions (191211770/191211780): the timetable of the Electronics module will indicate which units of study are equivalent to the old subject and should be followed
- n) End-of-foundation-year project: will be re-offered in this academic year. The admission requirements for this project are either that the sum of the grades for Network Analysis (191210050) and Basic Electronic Circuits (191211750) should be greater than or equal to 8, or you should have passed either the new Electric Circuits module or the new Electronics module.
- o) Students who have completed their final Bachelor's assignment but still have to do the unit of study Information Storage can do this in the form of an assignment with the consent of the relevant member of teaching staff. All other students no longer have to do this unit of study, and their final Bachelor's assignment will have a study load of 14.5 credits. Students who have already done the unit of study Information Storage will only have to do a final Bachelor's assignment worth 11.5 credits.