

**Examination Regulations (Rules)
of the Faculty of Engineering
at Christian-Albrechts-Universität zu Kiel (Kiel University)
for students of 'Electrical Engineering and Information Technology'
leading to a Master of Science degree (M.Sc.) - 2019
of 21 November 2018**

Version published on 21 December 2018 (NBl. HS MBWK Schl.-H. p. 77)

Based on Section 52 (1) 1 of the Schleswig-Holstein Higher Education Act (HSG) in the version published on 5 February 2016 (Law and Official Gazette for the Land of Schleswig-Holstein (GVObI. Schl.-H. p.39), amended by the law of 10 February 2018 (GVObI. Schl.-H., p. 68), after a resolution was passed by the Convention of the Faculty of Engineering of 24 October 2018, the following Rules were issued:

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§ 1
Scope of application

- (1) These degree-specific examination regulations in conjunction with the Examination Procedure Regulations (Rules) of Christian-Albrechts-Universität zu Kiel for students of Bachelor's and Master's Degree Programmes (PVO) apply to the teaching and assessment of the Master's degree programme "Electrical Engineering and Information Technology" at Kiel University.
- (2) Admission to modules offered by other faculties or other institutes of the same faculty and the respective module examinations are subject to the examination regulations of the respective faculties or institutes.

§ 2
Objective of the degree programme

- (1) The degree programme in Electrical Engineering and Information Technology leading to a Master of Science builds on the Bachelor's degree programme in Electrical Engineering and Information Technology at Kiel University and provides students with advanced knowledge, skills and scientific methods relating to the subject.
- (2) Graduates are able to analyse a specific task within their subject and independently and efficiently complete the task by applying scientific methods. Accordingly, graduates are particularly well-suited for challenging roles in professional practice or as early career researchers.
- (3) The specific profile of the consecutive degree programme is characterised by the objective of enabling graduates to consistently meet the challenges of professional practice in a German and international environment.

§ 3
Admission to degree programmes

- (1) The academic year applies; registrations are possible for summer and winter semesters.
- (2) Graduates from the seven-semester Bachelor's degree programme in Electrical Engineering and Information Technology at Kiel University are admitted to the Master's degree programme without any further technical requirements. Notwithstanding the language requirements in accordance with the study qualification rules (Studienqualifikationssatzung), graduates from other degree programmes and other institutions of higher education are admitted if the university degree of the graduate in question shows no substantial differences to the Bachelor's degree from the CAU in terms of scope and content. This decision on the equivalence rests with the Chair of the Examination Board. More details can be found in the Recognition Rules.

§ 4
Teaching and examination language

Lectures and examinations will be offered in English. More details can be found in the study qualification rules (Studienqualifikationssatzung).

§ 5
Structure and scope of curriculum, standard period of study

- (1) The total module requirement for successful completion of the degree programme amounts to a maximum of 48 contact hours per week (Semesterwochenstunden - SWS) and 60 ECTS credits, plus 30 ECTS credits for the Master's thesis.
- (2) The standard period of study including the Master's thesis is three semesters.

- (3) The Master's examination is comprised of the individual module examinations and the Master's thesis.
- (4) Within the scope of their degree programme, students select modules totalling 60 ECTS credits from the 'core modules', 'in-depth modules', 'seminars' and 'laboratory courses and projects'.
- (5) Details of all modules are provided in the module handbook. The Chairperson of the Examination Board oversees updating of the module handbook. The content is published on the Internet pages of the Electrical Engineering and Information Technology Examination Office.
- (6) Upon request, students may select modules offered by other institutes or faculties offering these modules due to available capacities and provided the institute offering the module agrees to this. After consultation with the respective module coordinator or subject administrator, the Chairperson of the Examination Board will determine whether the module equates sufficiently to the Master's degree programme in Electrical Engineering and Information Technology and to which module group the module should be allocated.

§ 6

Degree programme schedule

- (1) Students compile their desired curriculum at the start of the degree programme. They may choose a curriculum with or without a designated specialisation.
- (2) Regarding compilation of the modules within the scope of a curriculum, in accordance with the annex the following rules apply:
 - a. 45 ECTS credits are to be acquired from the 'core modules' and 'in-depth modules' together, of which at least 15 ECTS credits must stem from 'core modules' (module group 5000) and at least 15 ECTS credits from 'in-depth modules' (module group 6000).
 - b. 15 ECTS credits are to be acquired from 'seminars' and 'laboratory courses and projects' together, of which at least 5 ECTS credits must stem from 'seminars' (module group 7000) and at least 5 ECTS credits from 'laboratory courses and projects' (module group 8000).
- (3) All curricula must satisfy the requirements of (2) above. In the case of specialisation, the chosen compulsory elective modules must be compiled in such a way to ensure that the resulting curricula automatically fulfil the requirements of (2).
- (4) Modules totalling a maximum of 30 ECTS credits may be selected from a Chair of the Institute of Electrical Engineering and Information Technology in order to ensure a sufficiently broad spectrum of subjects. The Master's thesis remains unaffected by this. Modules jointly implemented by multiple Chairs will count in proportion to the share of the Chair in the respective module. The proportions of the corresponding modules are detailed in the module handbook. The Chairperson of the Examination Board shall decide in cases of doubt.
- (5) In terms of formal validity in accordance with (2) and (4) above, each curriculum requires the written approval of the Chairperson of the Examination Board. The same applies for any changes to an approved curriculum.
- (6) The curricula must be handed in to the Electrical Engineering and Information Technology Examination Office.

§ 7 Examinations

- (1) The following types of examination are permitted in the modules offered by the Institute of Electrical Engineering and Information Technology, and the Master's thesis, for the sections "core modules", "in-depth modules", "seminars", "laboratory courses and projects":
- Written examination (duration: maximum 180 minutes)
 - Oral examination (duration: 30 to 45 minutes)
 - Colloquium
 - Experiment
 - Practical task
 - Demonstration
 - Paper
 - Protocol
 - Work report
 - Written report
 - Term paper
 - Interview and interview report
 - Online test
 - Presentation

Individual details about the examinations to be completed for each module can be found in the module overview. If several of the types of examination listed above are given as an option, the valid type for one academic year will be announced on the notice board at the start of the module.

- (2) With the exception of written examinations, in accordance with (1), every examination can be taken as a group examination instead of an individual examination if the contributions from each candidate are clearly definable, can clearly be differentiated between and assessed, based on objective criteria. There will be an announcement at the start of the module if examinations are to be in the form of group examinations.
- (3) Module examinations from the required modules (Bachelor module groups 100 and 200), the Master module groups 5000 and 6000 and the Master's thesis will be graded. Examinations in the Master module groups 7000 and 8000 will not be graded.

§ 8 Examination prerequisites

- (1) If a module contains laboratory courses, practical exercises or language courses, admission to the examination assumes regular attendance at these courses.
- (2) If a module includes courses that are not mentioned in (1), admission to the examination assumes regular attendance at these courses, if the individual students cannot achieve the qualification objective without regular attendance, if attendance is necessary in order to grasp the basic subject-specific methods, or if acquiring competence is dependent on the presence of the other participants, or on being present at a certain place. This is the case for seminars and projects within the scope of this degree programme. The obligation for regular attendance at a seminar within the scope of this degree programme is based on the premise that, in addition to oral presentations given by students, the course also provides the opportunity for all seminar attendees to learn scientific discussion. As such, in addition to the acquisition of specialist knowledge, the learning objectives of a seminar specifically encompass the development of analytical and rhetorical skills, the use of presentation techniques and the ability to successfully work in teams. An essential learning objective within a project is the ability to

successfully work in teams; this is a learning objective that can only be achieved through regular attendance.

- (3) Course attendance is deemed regular if
 - a. all experiments relating to a laboratory course and practical exercise have been carried out. If a student misses a session for reasons in Section 54 (4) HSG, the lecturer can give him or her a substitute date.
 - b. in the case of a language course, project or a seminar, no more than 20% of the course dates have been missed without giving reasons for the non-attendance. Section 52 (4) HSG remains without prejudice; in justified exceptional cases, the module coordinator may specify an equivalent substitute for the course elements that have been missed.
- (4) Courses for which admission to the examination assumes regular attendance are marked in the annex.
- (5) Any additional requirements for admission to examinations will be stated in the module overview.

§ 9 Master's thesis

- (1) The application for admission to the Master's thesis is to be submitted in writing to the Examination Office.
- (2) The Master's thesis is to be written in English and may additionally include a summary in German.
- (3) Students who have demonstrably acquired a minimum of 45 ECTS credits in the Master's degree programme and meet the conditions required within the scope of degree programme admission will be admitted to the Master's thesis.
- (4) In justified exceptional cases, the Chairperson of the Examination Board may admit a candidate to the Master's thesis where the admission requirements in (3) above have not been met.
- (5) The Master's thesis may also be issued in the form of a group thesis, provided that all candidates in the group fulfil the requirements stated in (3) above and that the contributions from each individual candidate are clearly definable, can clearly be differentiated between and assessed, based on objective criteria.
- (6) When applying for admission to the Master's thesis, the examination candidate may propose first and second examiners and a topic for the thesis, without this giving rise to any claim for the proposal to be considered.
- (7) The thesis will be issued and supervised by a university or private lecturer working in the specialist field of Electrical Engineering and Information Technology at Kiel University.
- (8) If the thesis is to be prepared at a different institute at the Faculty of Engineering, at an institution outside of the Faculty of Engineering or outside the university, it requires approval by the Chairperson of the Examination Board.
- (9) The maximum period from when the topic is issued until the Master's thesis is submitted is six months.
- (10) The topic of the Master's thesis may be handed back only once and only within the first month of the preparation period.
- (11) The Master's thesis will be assessed by two examiners within six weeks of submission. The thesis supervisor is the first examiner.
- (12) The Master's thesis is to be submitted to the responsible Examination Office, on time, in the form of two hard copies and additionally one copy in a form suitable for standard electronic data processing. The Examination Office will record the date of submission.

§ 10

Overall grade for the Master's examination

- (1) For curricula without a designated specialisation, the overall grade will be calculated from the arithmetic mean of the 'core and in-depth modules' weighted at 45 and the grade for the Master's thesis weighted at 22.5. Accordingly, the weighting of 45 corresponds to the total ECTS credits acquired in the first two semesters for graded modules – thus, an average of 22.5 ECTS credits per semester. To give achievements in the third semester a corresponding weighting in respect of the overall grade, the grade for the Master's thesis is also weighted at 22.5.
- (2) The section grade for the 'core and in-depth modules' is calculated from the arithmetic mean of the core module grades and the in-depth module grades, with each section grade weighted with the ECTS credits obtained in that section.
- (3) The section grade from the 'core modules' and the section grade from the 'in-depth modules' is calculated from the arithmetic mean of the core or in-depth module grades in this section, weighted according to their ECTS credits.
- (4) For curricula with a designated specialisation, the overall grade will be calculated from the arithmetic mean of the 'specialisation modules and additional core and in-depth modules' weighted at 45 and the grade for the Master's thesis weighted at 22.5. Accordingly, the weighting of 45 corresponds to the total ECTS credits acquired in the first two semesters for graded modules – thus, an average of 22.5 ECTS credits per semester. To give achievements in the third semester a corresponding weighting in respect of the overall grade, the grade for the Master's thesis is also weighted at 22.5.
- (5) The section grade for the 'specialisation modules and additional core and in-depth modules' is calculated from the arithmetic mean of the section grades for 'core modules in the specialisation subject', 'in-depth modules in the specialisation subject' and 'additional core and in-depth modules', with each section grade weighted with the ECTS credits obtained in that section.
- (6) The section grades for 'core modules for specialisation in ...', 'in-depth modules for specialisation in ...' and 'additional core and in-depth modules' are respectively calculated from the arithmetic mean of the module grades in the corresponding section, weighted according to their ECTS credits.
- (7) Students may sit more than the required number of examinations in the 'core modules' and 'in-depth modules' or 'core modules in the specialisation subject', 'in-depth modules in the specialisation subject' and 'additional core and in-depth modules' and ultimately choose which grades are recorded for the section grade. Corresponding additional examinations must be taken by no later than the end of the examination period in which the Master's examination is passed. Students wishing to acquire more than the required ECTS credits must notify the Examination Office of this in good time. Notification will be considered to be in good time if done within five working days of the date the student knows or is in a position to know that they have acquired, by way of successful examination, the necessary number of ECTS credits for the Master's examination.

Where notification is not forthcoming or is not in good time, the examination results of the additional modules will not be considered for calculating the grade.

Students who have acquired more than the required number of ECTS credits in a particular section are to provide the Examination Office with written notification of the modules to be considered for calculating the section grade within five days of receipt of the last examination result.

This notification must be signed by the student. If a student does not notify the Examination Office of the modules to be considered, or fails to do so in good time, the modules with the best grades will be used for the calculation.

§ 11
Academic title

The student is awarded the academic degree of Master of Science (M.Sc.) if he or she has passed the Master's examination.

§ 12
Examination Board

- (1) The Electrical Engineering and Information Technology Examination Board is responsible for the organisation of examinations in accordance with these Examination Regulations, as well as for the tasks allocated by these Examination Regulations. The business of the Examination Board is managed by the relevant Examination Office.
- (2) The Examination Board consists of four members from the university lecturers' group, one member from the scientific staff group and two members of the student body.

§ 13
Entry into force, expiry, transitional provisions

- (1) These rules enter into force on 1 October 2019. They apply to students who register for the winter semester 2019/20 or later for the first or for a higher semester for this degree programme.
- (2) At the same time, the previous Examination Regulations (Rules) of the Faculty of Engineering at Christian-Albrechts-Universität zu Kiel (Kiel University) for students of 'Electrical Engineering and Information Technology' leading to a Master of Science degree (M.Sc.) of 10 June 2015 (NBI. HS MSGWG Schl.-H., page 129), amended by the Rules of 27 July 2017 (NBI. HS MBWK Schl.-H., p. 71), cease to be in force.
- (3) A qualification in accordance with the relevant degree-specific examination regulations is possible until 31 March 2022 for students who, at the time these Examination Regulations enter into force, are registered at Christian-Albrechts-Universität zu Kiel for the Master of Science (M.Sc.) degree programme in Electrical Engineering and Information Technology, and who are studying according to the degree-specific examination regulations that expired in accordance with Paragraph 2. If modules are offered in a different form, these must be completed under the new version.
- (4) Students can apply to change to the new degree-specific examination regulations. Module examinations and their ECTS credits that have been completed and passed in full by the date these Rules enter into force will remain valid.
- (5) Students continuing their degree programme under the old degree-specific examination regulations expiring according to Paragraph 2 will automatically switch to the new Examination Regulations as of the summer semester 2022.
- (6) If a student has completed and passed independent parts of a module examination in accordance with (4) or (5) above, these partial achievements will be recognised accordingly. The Examination Board determines which additional examinations are necessary to complete the module, under consideration of the module's learning targets and the purpose of the examination.
- (7) Examinations failed before these Rules entered into force will be set off against the number of attempts allowed under the new Examination Regulations, provided the structure of the new module examinations permits recognition.

For information purposes only, the German original is binding.

- (8) The Examination Board decides regarding special cases of hardship for which the student is not responsible.

The University Board at Kiel Univeristy granted its approval in accordance with Section 52 (1) 1 of the Schleswig-Holstein Higher Education Act (HSG) in its letter dated 21 November 2018.

Kiel, 21 November 2018

Prof. Dr Hermann Kohlstedt
Dean of the Faculty of Engineering
at Kiel University

Annex: Module groups and ECTS credits

	Module group 5000 Core module	Module group 6000 In-depth module	Module group 7000 Seminars	Module group 8000 Laboratory courses and projects	Master's thesis
Courses	Lectures and exercises in accordance with the module overview ⁽¹⁾	Lectures and exercises in accordance with the module overview ⁽¹⁾	Seminars in accordance with the module overview ⁽¹⁾	Laboratory courses and projects in accordance with the module overview ⁽¹⁾	In accordance with Section 9
ECTS credits	15	15	5 ⁽²⁾	5 ⁽²⁾	30
Minimum number of variable ECTS credits	15		5 ⁽²⁾		
Total of ECTS credits	90				

⁽¹⁾ All modules and courses are organised and defined according to module groups within the module overview.

⁽²⁾ Attendance is compulsory for courses relating to module groups 7000 and 8000.

Appendix A:
(not part of the Rules)

Date: 10.03.2019

**Module Overview for the Master's Degree Programme in
Electrical Engineering and Information Technology**

Glossary

Compulsory – Pflicht
Compulsory Module – Pflichtmodul
Compulsory Elective – Wahlpflicht
Compulsory Elective Module - Wahlpflichtmodul
Contact Hours per week (weekly 45-minute teaching units) – Semesterwochenstunden (SWS)
Core Module - Kernmodul
Course Type – Lehrform

Duration – Dauer

ECTS Credits – Leistungspunkte (LP)
Evaluation – Bewertungsart
Examination – Prüfungsleistung
Exercise – Übung

Graded – benotet

In-depth Module - Vertiefungsmodul

Lab Course / Laboratory Course – Praktikum
Lecture – Vorlesung

Module Course – Modullehrveranstaltung

None – keine
Not Graded – unbenotet

Oral Examination – Mündliche Prüfung

Practical Exercise – Praktische Übung
Prerequisites - Zulassungsvoraussetzungen
Project - Projekt

Semester – Semesterlage
Seminar - Seminar
Summer Semester (SuSe) – Sommersemester (SoSe)
Status – Status

Weighting – Gewichtung
Workload – Arbeitsaufwand
Winter Semester (WiSe) – Wintersemester (WiSe)
Written Examination – Klausur

1. Core Modules (Kernmodule)

etit5001-01a							
Advanced Digital Signal Processing							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	Presentation	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Advanced Digital Signal Processing	Lecture + Exercise	2 + 2	5	Compulsory	Oral Examination	Graded	100 %
etit5002-01a							
Design of Power Electronics Converters							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Design of Power Electronics Converters	Lecture + Exercise	2 + 1,5	5	Compulsory	Written or Oral Examination	Graded	100 %
etit5003-01a							
Digital Communications II							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Digital Communications II	Lecture + Exercise	2 + 2	5	Compulsory	Written Examination	Graded	100 %
etit5004-01a							
Digital Electronics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Digital Electronics	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit5005-01a							
Fields and Waves in Biological Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Fields and Waves in Biological Systems	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %

For information purposes only, the German original is binding.

etit5006-01a							
Fundamentals of Electronic Device Fabrication Technology							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Fundamentals of Electronic Device Fabrication Technology	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit5007-01a							
Information Theory and Coding I							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Information Theory and Coding I	Lecture + Exercise	2 + 1	5	Compulsory	Written Examination	Graded	100 %
etit5008-01a							
Information Theory and Coding II							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Information Theory and Coding II	Lecture + Exercise	2 + 1	5	Compulsory	Written Examination	Graded	100 %
etit5009-01a							
Mathematical Methods in Field Theory							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Mathematical Methods in Field Theory	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit5010-01a							
Microwave Circuits and Systems: Passive Circuits							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Microwave Circuits and Systems: Passive Circuits	Lecture + Exercise	2 + 2	5	Compulsory	Oral Examination	Graded	100 %

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etit5011-01a							
Modeling and Control of Power Electronics Converters							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Modeling and Control of Power Electronics Converters	Lecture + Exercise	2 + 1,5	5	Compulsory	Written or Oral Examination	Graded	100 %
etit5012-01a							
Neuromorphic Engineering							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Neuromorphic Engineering	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit5013-01a							
Nonlinear Control Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Nonlinear Control Systems	Lecture + Exercise	3 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit5014-01a							
Optical Communications							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Optical Communications	Lecture + Exercise	3 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit5015-01a							
Optimization and Optimal Control							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Optimization and Optimal Control	Lecture + Exercise	3 + 1	5	Compulsory	Oral Examination	Graded	100 %

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etit5016-01a		Wireless Communications					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Wireless Communications	Lecture + Exercise	2 + 1	5	Compulsory	Written Examination	Graded	100 %
etit5017-01a		Introduction to Low-power CMOS System Design					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Introduction to Low-power CMOS System Design	Lecture + Exercise	2 + 1	5	Compulsory	Written Examination or Online-Test	Graded	100 %
etit5018-01a		Rigid Body Dynamics and Robotics					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Rigid Body Dynamics and Robotics	Lecture + Exercise	2 + 1	5	Compulsory	Written Examination	Graded	100

2. In-depth Modules (Vertiefungsmodule)

etit6001-01a							
Advanced Photonic Communication Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Advanced Photonic Communication Systems	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6002-01a							
Selected Topics in Wireless Communications and Power Grids							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Selected Topics in Wireless Communications and Power Grids	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6003-01a							
Adaptive Filters							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	Presentation	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Adaptive Filters	Lecture + Exercise	3 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6004-01a							
Applied Nonlinear Dynamics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Applied Nonlinear Dynamics	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %

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etit6005-01a							
Computational Electromagnetics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Computational Electromagnetics	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6006-01a							
Control of PDE Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Control of PDE Systems	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6007-01a							
Electric Drives							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Electric Drives	Lecture + Exercise	2 + 1,5	5	Compulsory	Oral Examination	Graded	100 %
etit6008-01a							
Fiber-optic Communication Networks							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Fiber-optic Communication Networks	Lecture + Exercise	2 + 2	5	Compulsory	Oral Examination	Graded	100 %
etit6009-01a							
Grid Converters for Renewable Energy Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Grid Converters for Renewable Energy Systems	Lecture + Exercise	2 + 1,5	5	Compulsory	Oral Examination	Graded	100 %

For information purposes only, the German original is binding.

etit6010-01a							
Interface and Surface Analysis Methods in Materials Science							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Interface and Surface Analysis Methods in Materials Science	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit6011-01a							
Microwave Circuits and Systems: Active Circuits							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Microwave Circuits and Systems: Active Circuits	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6012-01a							
Microwave Filters: Theory, Design, and Realization							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Microwave Filters: Theory, Design, and Realization	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit6013-01a							
Noise in Communications and Measurement Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Noise in Communications and Measurement Systems	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit6014-01a							
Pattern Recognition							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	Presentation	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Pattern Recognition	Lecture + Exercise	3 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %

For information purposes only, the German original is binding.

etit6015-01a		Photonic Components					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Photonic Components	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6016-01a		Renewable Energy Systems					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Renewable Energy Systems	Lecture + Exercise	2 + 1,5	5	Compulsory	Oral Examination	Graded	100 %
etit6017-01a		Tomographical Methods for Medicine					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Tomographical Methods for Medicine	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6018-01a		Integrated Circuit Design for Medical Applications					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Integrated Circuit Design for Medical Applications	Lecture + Exercise	2 + 2	5	Compulsory	Written or Oral Examination	Graded	100 %
etit6019-01a		Design and Analysis of Selected Fundamental CMOS Circuits					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Design and Analysis of Selected Fundamental CMOS Circuits	Lecture	2	5	Compulsory	Presentation	Graded	100 %

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etit6020-01a							
Wide-Bandgap Semiconductors							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Wide-Bandgap Semiconductors	Lecture + Exercise	2 + 1	5	Compulsory	Written or Oral Examination	Graded	100 %
etit6021-01a							
Advanced Methods in Nonlinear Control							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Advanced Methods in Nonlinear Control	Lecture + Exercise	2 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6022-01a							
Numerical Simulation of Analog and Digital Communication Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Numerical Simulation of Analog and Digital Communication Systems	Lecture + Exercise	3 + 1	5	Compulsory	Oral Examination	Graded	100 %
etit6023-01a							
Control of Robot Systems							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Control of Robot Systems	Lecture + Exercise	2 + 1	5	Compulsory	Take-home Examination and Oral Examination	Graded	100 %
etit6024-01a							
Fundamentals of Acoustics (PNR)							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Fundamentals of Acoustics	Lecture + Exercise	3 + 1	5	Compulsory	Oral Examination (PNR)	Graded	100 %

3. Seminars (Seminare)

etit7001-01a Seminar Advanced Topics in Microwave Technologies							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Advanced Topics in Microwave Technologies	Seminar	2	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7002-01a Seminar Analysis of Scientific Papers							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Analysis of Scientific Papers	Seminar	3	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7003-01a Seminar Communications							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Communications	Seminar	3	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7004-01a Seminar Information and Coding Theory							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Information and Coding Theory	Seminar	3	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7005-01a Seminar Integrated Systems and Photonics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Integrated Systems and Photonics	Seminar	2	5	Compulsory	Presentation	Not Graded	0 %

For information purposes only, the German original is binding.

etit7006-01a							
Seminar Nanoelectronics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Nanoelectronics	Seminar	3	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7007-01a							
Seminar on Current Topics in Biomedical Engineering							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar on Current Topics in Biomedical Engineering	Seminar	3	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7008-01a							
Seminar on Selected Topics in Digital Signal Processing							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar on Selected Topics in Digital Signal Processing	Seminar	2	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7009-01a							
Seminar on Selected Topics in Systems and Control							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar on Selected Topics in Systems and Control	Seminar	2	5	Compulsory	Presentation and Paper	Not Graded	0 %
etit7010-01a							
Seminar Power Electronics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Power Electronics	Seminar	2	5	Compulsory	Presentation and Paper	Not Graded	0 %

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etit7011-01a		Seminar X-ray Diffraction Methods for Thin Film Analysis					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar X-ray Diffraction Methods for Thin Film Analysis	Lecture + Practical Exercise + Seminar	1 + 1 + 1	5	Compulsory	Presentation	Not Graded	0 %
etit7012-01a		Seminar Selected Topics in Medical Electronics					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
Seminar Selected Topics in Medical Electronics	Seminar	2	5	Compulsory	Presentation and Paper	Not Graded	0 %

4. Laboratory Courses (Praktika)

etit8001-01a		M.Sc. Laboratory Advanced Control					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Advanced Control	Practical Exercise	4	5	Compulsory	Colloquia, Practical Tasks and Protocols	Not Graded	0 %
etit8002-01a		M.Sc. Laboratory Communications					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Communications	Practical Exercise	4	5	Compulsory	Colloquia and Practical Tasks	Not Graded	0 %
etit8003-01a		M.Sc. Laboratory Information Processing					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Information Processing	Practical Exercise	4	5	Compulsory	Colloquia and Practical Tasks	Not Graded	0 %
etit8004-01a		M.Sc. Laboratory Microwave Technology and Electromagnetic Compatibility					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Microwave Technology and Electromagnetic Compatibility	Practical Exercise	4	5	Compulsory	Colloquia, Practical Tasks and Protocols	Not graded	0 %

For information purposes only, the German original is binding.

etit8005-01a							
M.Sc. Laboratory Optoelectronics							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Optoelectronics	Practical Exercise	3	5	Compulsory	Colloquia, Practical Tasks, Reports and Presentation	Not Graded	0 %
etit8006-01a							
M.Sc. Laboratory Power Electronics - Renewable Energy - Drive Engineering							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Power Electronics - Renewable Energy - Drive Engineering	Practical Exercise	5	5	Compulsory	Colloquia, Practical Tasks and Protocols	Not Graded	0 %
etit8007-01a							
M.Sc. Laboratory Real-time Signal Processing							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Real-time Signal Processing	Practical Exercise	4	5	Compulsory	Practical Task, Presentation and Paper	Not Graded	0 %
etit8008-01a							
M.Sc. Laboratory Examples in Computerized IC Testing							
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Examples in Computerized IC Testing	Practical Exercise + Seminar	2 + 1	5	Compulsory	Report or Oral Examination	Not Graded	0 %

For information purposes only, the German original is binding.

etit8009-01a		M.Sc. Laboratory Digital Circuit Design					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	5 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc. Laboratory Digital Circuit Design	Practical Exercise	4	5	Compulsory	Report and Presentation	Not Graded	0 %
etit8010-01a		M.Sc. Project Power Electronics, Control and Communications in Energy Systems					
Semester	Duration			Status	Prerequisites	ECTS Credits / Workload	
1. or 2. Semester	1 Semester			Compulsory Elective	None	10 / 150	
Module Courses	Course Type	Contact Hours per Week	ECTS Credits	Status	Examination	Evaluation	Weighting
M.Sc Project Power Electronics, Control and Communications in Energy Systems	Project	10	10	Compulsory	Report and Presentation	Not Graded	0 %

Appendix B:
(not part of the Rules)

Date: 01.06.2018

**Specialisations in the Master's Degree Programme in
Electrical Engineering and Information Technology**

Curricula with specialisation

B1. Specialisation in 'Automation and System Theory'

Core modules for specialisation in Automation and System Theory

At least 3 of the following 4 compulsory elective modules must be taken:

- Advanced Digital Signal Processing (etit5001-01a, 5 ECTS, WiSe)
- Rigid Body Dynamics and Robotics (etit5018-01a, 5 ECTS, WiSe)
- Nonlinear Control Systems (etit5013-01a, 5 ECTS, SuSe)
- Optimization and Optimal Control (etit5015-01a, 5 ECTS, WiSe)

In-depth modules for specialisation in Automation and System Theory

At least 3 of the following 4 compulsory elective modules must be taken:

- Adaptive Filters (etit6003-01a, 5 ECTS, SuSe)
- Advanced Methods in Nonlinear Control (etit6021-01a, 5 ECTS, WiSe)
- Control of Robot Systems (etit6023-01a, 5 ECTS, SuSe)
- Pattern Recognition (etit6014-01a, 5 ECTS, WiSe)

Additional core and in-depth modules

Within the specialisation in 'Automation and System Theory' all modules in the module groups 5000 and 6000 not included in the sections 'Core modules for specialisation in Automation and System Theory' or 'In-depth modules for specialisation in Automation and System Theory' are allocated to the section 'Additional core and in-depth modules'. In the section 'Additional core and in-depth modules', enough modules are to be selected from the module groups 5000 (core modules) and 6000 (in-depth modules) to achieve a total of 45 ECTS credits from the three sections 'Core modules for specialisation in Automation and System Theory', 'In-depth modules for specialisation in Automation and System Theory' and 'Additional core and in-depth modules'.

Seminars for specialisation in Automation and System Theory

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Automation and System Theory' and 'Laboratory courses and projects for specialisation in Automation and System Theory'. In the section 'Seminars for specialisation in Automation and System Theory' at least 1 of the following 2 compulsory elective modules must be taken:

- Seminar on Selected Topics in Systems and Control (etit7009-01a, 5 ECTS, SuSe)
- Seminar on Selected Topics in Digital Signal Processing (etit7008-01a, 5 ECTS, WiSe)

Laboratory courses and projects for specialisation in Automation and System Theory

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Automation and System Theory' and 'Laboratory courses and projects for specialisation in Automation and System Theory'. In the section 'Laboratory courses and projects for specialisation in Automation and System Theory' at least 1 of the following 2 compulsory elective modules must be taken:

For information purposes only, the German original is binding.

- M.Sc. Laboratory Advanced Control (etit8001-01a, 5 ECTS, WiSe)
- M.Sc. Laboratory Real-time Signal Processing (etit8007-01a, 5 ECTS, SuSe)

B2. Specialisation in 'Devices and Circuits'

Core modules for specialisation in Devices and Circuits

At least 3 of the following 4 compulsory elective modules must be taken:

- Design of Power Electronics Converters (etit5002-01a, 5 ECTS, SuSe)
- Fundamentals of Electronic Device Fabrication Technology (etit5006-01a, 5 ECTS, WiSe)
- Introduction to Low-power CMOS System Design (etit5017-01a, 5 ECTS, SuSe)
- Microwave Circuits and Systems: Passive Circuits (etit5010-01a, 5 ECTS, SuSe)

In-depth modules for specialisation in Devices and Circuits

At least 3 of the following 4 compulsory elective modules must be taken:

- Integrated Circuits for Medical Applications (etit6018-01a, 5 ECTS, SuSe)
- Microwave Circuits and Systems: Active Circuits (etit6011-01a, ECTS, WiSe)
- Photonic Components (etit6015-01a, 5 ECTS, WiSe)
- Wide-bandgap Semiconductors (etit6020-01a, 5 ECTS, WiSe)

Additional core and in-depth modules

Within the specialisation in 'Devices and Circuits' all modules in the 5000 and 6000 module groups not included in the sections 'Core modules for specialisation in Devices and Circuits' or 'In-depth modules for specialisation in Devices and Circuits' are allocated to the section 'Additional core and in-depth modules'.

In the section 'Additional core and in-depth modules', enough modules are to be selected from the module groups 5000 (core modules) and 6000 (in-depth modules) to achieve a total of 45 ECTS credits from the three sections 'Core modules for specialisation in Devices and Circuits', 'In-depth modules for specialisation in Devices and Circuits' and 'Additional core and in-depth modules'.

Seminars for specialisation in Devices and Circuits

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Devices and Circuits' and 'Laboratory courses and projects for specialisation in Devices and Circuits'. In the section 'Seminars for specialisation in Devices and Circuits' at least 1 of the following 2 compulsory elective modules must be taken:

- Seminar Nanoelectronics (etit7006-01a, 5 ECTS, WiSe or SuSe)
- Seminar Selected Topics in Medical Electronics (etit7012-01a, 5 ECTS, WiSe)

Laboratory courses and projects for specialisation in Devices and Circuits

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Devices and Circuits' and 'Laboratory courses and projects for specialisation in Devices and Circuits'. In the section 'Laboratory courses and projects for specialisation in Devices and Circuits' at least 1 of the following 2 compulsory elective modules must be taken:

- M.Sc. Laboratory Digital Circuit Design (etit8009-01a, 5 ECTS, Semester, WiSe)
- M.Sc. Laboratory Examples in Computerized IC Testing (etit8008-01a, 5 ECTS, SuSe)

B3. Specialisation in 'Digital Communications'

Core modules for specialisation in Digital Communications

At least 3 of the following 5 compulsory elective modules must be taken:

- Advanced Digital Signal Processing (etit5001-01a, 5 ECTS, WiSe)
- Digital Communications II (etit5003-01a, 5 ECTS, WiSe)
- Information Theory and Coding I (etit5007-01a, 5 ECTS, WiSe)
- Optical Communications (etit5014-01a, 5 ECTS, SuSe)
- Wireless Communications (etit5016-01a, 5 ECTS, SuSe)

In-depth modules for specialisation in Digital Communications

The following 3 compulsory modules must be taken:

- Selected Topics in Wireless Communications and Power Grids (etit6002-01a, 5 ECTS, WiSe)
- Adaptive Filters (etit6003-01a, 5 ECTS, SuSe)
- Fiber-optic Communication Networks (etit6008-01a, 5 ECTS, SuSe)

Additional core and in-depth modules

Within the specialisation in 'Digital Communications' all modules in the 5000 and 6000 module groups not included in the sections 'Core modules for specialisation in Digital Communications' or 'In-depth modules for specialisation in Digital Communications' are allocated to the section 'Additional core and in-depth modules'.

In the section 'Additional core and in-depth modules', enough modules are to be selected from the module groups 5000 (core modules) and 6000 (in-depth modules) to achieve a total of 45 ECTS credits from the three sections 'Core modules for specialisation in Digital Communications', 'In-depth modules for specialisation in Digital Communications' and 'Additional core and in-depth modules'.

Seminars for specialisation in Digital Communications

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Digital Communications' and 'Laboratory courses and projects for specialisation in Digital Communications'. In the section 'Seminars for specialisation in Digital Communications' at least 1 of the following 3 compulsory elective modules must be taken:

- Seminar Information and Coding Theory (etit7004-01a, 5 ECTS, WiSe or SuSe)
- Seminar Communications (etit7003-01a, 5 ECTS, WiSe or SuSe)
- Seminar on Selected Topics in Digital Signal Processing (etit7008-01a, 5 ECTS, WiSe)

Laboratory courses and projects for specialisation in Digital Communications

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Digital Communications' and 'Laboratory courses and projects for specialisation in Digital Communications'. In the section 'Laboratory courses and projects for specialisation in Digital Communications' at least 1 of the following 3 compulsory elective modules must be taken:

- M.Sc. Laboratory Communications (etit8002-01a, 5 ECTS, SuSe)
- M.Sc. Laboratory Real-time Signal Processing (etit8007-01a, 5 ECTS, SuSe)
- M.Sc. Laboratory Information Processing (etit8003-01a, 5 ECTS, WiSe)

B4. Specialisation in 'Medical Applications'

Core modules for specialisation in Medical Applications

At least 3 of the following 4 compulsory elective modules must be taken:

- Advanced Digital Signal Processing (etit5001-01a, 5 ECTS, WiSe)
- Fields and Waves in Biological Systems (etit5005-01a, 5 ECTS, SuSe)
- Neuromorphic Engineering (etit5012-01a, 5 ECTS, WiSe)
- Nonlinear Control (etit5013-01a, 5 ECTS, SuSe)

In-depth modules for specialisation in Medical Applications

At least 3 of the following 4 compulsory elective modules must be taken:

- Integrated Circuit Design for Medical Applications (etit6018-01a, 5 ECTS, SuSe)
- Noise in Communications and Measurement Systems (etit6013-1a, 5 ECTS, SuSe)
- Pattern Recognition (etit6014-01a, 5 ECTS, WiSe)
- Tomographic Methods for Medicine (etit6017-01a, 5 ECTS, WiSe)

Additional core and in-depth modules

Within the specialisation in 'Medical Applications' all modules in the 5000 and 6000 module groups not included in the sections 'Core modules for specialisation in Medical Applications' or 'In-depth modules for specialisation in Medical Applications' are allocated to the section 'Additional core and in-depth modules'.

In the section 'Additional core and in-depth modules', enough modules are to be selected from the module groups 5000 (core modules) and 6000 (in-depth modules) to achieve a total of 45 ECTS credits from the three sections 'Core modules for specialisation in Medical Applications', 'In-depth modules for specialisation in Medical Applications' and 'Additional core and in-depth modules'.

Seminars for specialisation in Medical Applications

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Medical Applications' and 'Laboratory courses and projects for specialisation in Medical Applications'. In the section 'Seminars for specialisation in Medical Applications' at least 1 of the following 2 compulsory elective modules must be taken:

- Seminar on Current Topics in Biomedical Engineering (etit7007-01a, 5 ECTS, SuSe)
- Seminar on Selected Topics in Digital Signal Processing (etit7008-01a, 5 ECTS, WiSe)

Laboratory courses and projects for specialisation in Medical Applications

A total of 3 modules must be taken in the sections 'Seminars for specialisation in Medical Applications' and 'Laboratory courses and projects for specialisation in Medical Applications'. In the section 'Laboratory courses and projects for specialisation in Medical Applications' at least 1 of the following 2 compulsory elective modules must be taken:

- M.Sc. Laboratory Microwave Technology and Electromagnetic Compatibility (etit8004-01a, 5 ECTS, WiSe)
- M.Sc. Laboratory Real-time Signal Processing (etit8007-01a, 5 ECTS, SuSe)

B5. Specialisation in 'Power Electronics, Control and Communications in Energy Systems'

Core modules for specialisation in Power Electronics, Control and Communications in Energy Systems

At least 3 of the following 4 compulsory elective modules must be taken:

- Design of Power Electronics Converters (etit5002-01a, 5 ECTS, SuSe)
- Modeling and Control of Power Electronics Converters (etit5011-01a 5 ECTS, WiSe)
- Nonlinear Control Systems (etit5013-01a, 5 ECTS, SuSe)
- Optimization and Optimal Control (etit5015-01a, 5 ECTS, SuSe)

In-depth modules for specialisation in Power Electronics, Control and Communications in Energy Systems

At least 3 of the following 4 compulsory elective modules must be taken:

- Advanced Methods in Nonlinear Control (etit6021-01a, 5 ECTS)
- Electric Drives (etit6007-01a, 5 ECTS, WiSe)
- Grid Converters for Renewable Energy Systems (etit6009-01a, 5 ECTS, WiSe)
- Selected Topics in Wireless Communications and Power Grids (etit6002-01a, 5 ECTS, WiSe)

Additional core and in-depth modules

Within the specialisation in 'Power Electronics, Control and Communications in Energy Systems' all modules in the 5000 and 6000 module groups not included in the sections 'Core modules for specialisation in Power Electronics, Control and Communications in Energy Systems' or 'In-depth modules for specialisation in Power Electronics, Control and Communications in Energy Systems' are allocated to the section 'Additional core and in-depth modules'.

In the section 'Additional core and in-depth modules', enough modules are to be selected from the module groups 5000 (core modules) and 6000 (in-depth modules) to achieve a total of 45 ECTS credits from the three sections 'Core modules for specialisation in Power Electronics, Control and Communications in Energy Systems', 'In-depth modules for specialisation in Power Electronics, Control and Communications in Energy Systems' and 'Additional core and in-depth modules'.

Seminars for specialisation in Power Electronics, Control and Communications in Energy Systems

A total of 2 modules must be taken in the sections 'Seminars for specialisation in Power Electronics, Control and Communications in Energy Systems' and 'Laboratory courses and projects for specialisation in Power Electronics, Control and Communications in Energy Systems'.

In the section 'Seminars for specialisation in Power Electronics, Control and Communications in Energy Systems', one of the following 3 compulsory elective modules can be taken:

- Seminar Communications (etit7003-01a, 5 ECTS, WiSe or SuSe)
- Seminar Power Electronics (etit7010-01a, 5 ECTS, WiSe)
- Seminar on Selected Topics in Systems and Control (etit7009-01a, 5 ECTS, SuSe)

Laboratory courses and projects for specialisation in Power Electronics, Control and Communications in Energy Systems

A total of 2 modules must be taken in the sections 'Seminars for specialisation in Power Electronics, Control and Communications in Energy Systems' and 'Laboratory courses and projects for specialisation in Power Electronics, Control and Communications in Energy Systems'.

The following compulsory module must be taken in the section 'Laboratory courses and projects for specialisation in Power Electronics, Control and Communications in Energy Systems'.

For information purposes only, the German original is binding.

- M.Sc. Project Power Electronics, Control and Communications in Energy Systems (etit8010-01a, 10 ECTS, SuSe or WiSe)