For information purposes only, the German original is binding.

Examination Regulations (Rules) of the Faculty of Engineering for the Discipline "Digital Communications", leading to a Master of Science Degree (M.Sc.) at Christian-Albrechts-Universität zu Kiel (Kiel University)

of 18 June 2015

Version published on 14 July 2015 (NBI. HS MSGWG Schl.-H. p. 129), amended by statute of 15 July 2015, published on 24 September 2016 (NBl. HS. MSGWG Schl.-H. p. 139), amended by statute of 27 July 2017, published on 28 September 2017 (NBl. HS. MBWK Schl.-H. p. 71)

Based on Section 52 (1) 1 of the Schleswig-Holstein Higher Education Act (HSG) of 28 February 2007 (Law and Ordinance Gazette of Schleswig-Holstein (GVOBl. Schl.-H.), p. 184), most recently amended by Article 34 of the Act 11 Dezember 2014 (GVOBl. Schl.-H., p. 440), after a resolution was passed by the Faculty Convention of the Faculty of Engineering of 22 April 2015 and by an urgent decision of the dean of the Faculty of Engineering on 5 May 2015 the following Rules were issued:

Table of contents:

§ 1
Scope of application

(1) These Examination Regulations in conjunction with the Examination Procedure Regulations of Kiel University apply to students of the Master's degree programme in the subject "Digital Communications" at Kiel University

(2) They apply to
- all modules which are exclusively part of the degree programmes regulated by these Examination Regulations,
- all modules which are part of the degree programmes regulated by these Examination Regulations, and which are simultaneously exported to other degree programmes;
- all modules which are exclusively part of other degree programmes as exported modules.

(3) Special regulations for individual modules can be agreed upon between the Examination Boards involved.

§ 2
Objective of the degree programme

The degree programme aims to equip graduates with a sound knowledge in the field of Digital Communications. It should qualify graduates to understand the diverse issues within this field and to carry out research using scientific methods. Based on these skills and equipped with this knowledge the graduates should be able to work in the various occupational fields of a Master of Science in Digital Communications.

§ 3
Structure of curriculum

The standard period of study for the Master's degree programme is four semesters. The degree programme encompasses approximately 67 weekly 45-minute teaching units for the duration of one semester of about 12 weeks (Semesterwochenstunden - SWS) and 120 ECTS credits, including 30 ECTS credits for the Master's thesis.
The degree programme is divided into the following sections:

1. Compulsory modules: At least 34 ECTS credits must be obtained in the compulsory modules, which are defined in the annex. All modules in this section are graded.
2. Technical optional modules: At least 32 ECTS credits must be obtained in the technical optional modules, which are defined in the annex. Here, modules covering at least 4 ECTS credits must be completed from each of the three optional blocks of "Applied Communications and Networks", "Communication Devices" and "Applied Signal Processing". The remaining credits can be selected from all three optional blocks mentioned above. All modules in this section are graded.
3. Lab Courses: At least 14 ECTS credits must be obtained in three lab courses, which are defined in the annex. The modules in this section are partly not graded. The grades are not part of the final grade.
4. Non-technical optional modules: A total of at least 10 ECTS credits must be obtained in a minimum of two non-technical optional modules, which are defined in the annex. This includes a compulsory German Course in conjunction with the studies (studienbegleitend) for students who are unable to provide evidence of sufficient German skills, if this course is currently on offer. With the written permission from the Chairperson of the Examination Board, this course may be replaced by another module to learn a foreign language provided German language skills are proven. Level B1 of the Common European Framework of Reference for Languages (CEFR) is regarded as sufficient with regard to German language skills. Proof is to be provided in the form of secondary school qualifications or comparable certificates. Furthermore, in this section, non-technical modules offered at Kiel University that serve the purpose of acquiring soft skills can be selected. As part of the free choice of modules from the range on offer at Kiel University, students may select any module which has been opened up by the institutes offering these modules due to available capacities, or for which these institutes have explicitly approved taking the module in individual cases. For example, the modules in Section 4 of the module overview in the Appendix to these Degree-specific Examination Regulations are recommended.

§ 4
Academic year

(1) The modules for students in odd-numbered semesters according to the programme schedule (annex) will only be offered in a winter semester, and only offered in a summer semester for even-numbered semesters.

(2) Registrations during odd-numbered semesters are only possible for a winter semester. Registrations during even-numbered semesters are only possible for a summer semester.

§ 5
Teaching and examination language

(1) Lectures will be offered in English.

(2) Module examinations will be held in English. Upon application, examinations may also be held in German.

(3) The Master's thesis may be produced in German or English.

§ 6
Purpose of the Master's examination

The Master's examination is a more advanced degree qualifying for a professional career. The Master's examination determines whether the examination candidate has mastered the subject-specific principles and the methodological tools in the practical side of the selected discipline.

§ 7
Academic title

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

§ 8
Examination Board

(1) An Examination Board is to be established for the organisation of the examinations and the tasks assigned under these Examination Procedure Regulations. It is composed of seven members. The term of office for student members is one year; for all other members it is two years. Members of the Examination Board may be re-elected.

(2) The Faculty Convention selects four members of the Examination Board from the group of university professors, two members from the group of students and one member from the group of the scientific personnel. They select a deputy for each member from the appropriate group. Furthermore, an Examination Board member from the first group mentioned is selected as Chair of the Examination Board. Another person from the same group is selected as Deputy Chair. The Chair, as well as the majority of the members of the Examination Board from the group of university professors must represent a subject within Electrical Engineering.

(3) The Examination Board makes suggestions concerning improvements to the curriculum and the degree-specific examination regulations.

(4) The day-to-day business of the Examination Board is managed by its Chair. He or she ensures that the provisions in these Degree-specific Examination Regulations are adhered to and provides regular reports to the faculty regarding the development of examinations and study periods, as well as the actual time needed to prepare a Master's thesis and the distribution of module and final grades.

§ 9
Admission to the Master's degree programme

(1) Requirements for admission to the degree programme regulated by these Rules are:

a) A first degree qualifying for a professional career in the subject of Electrical Engineering / Information Technology, which at least

aa) corresponds to a Bachelor's examination following a scientifically-oriented degree programme in the subject of Electrical Engineering / Information Technology or

bb) corresponds to a Bachelors' examination in a *related* subject at an institution of higher education in Germany or abroad that is at least equivalent to a German university of applied sciences, with evidence of suitable prior knowledge. Here, the result must be assessed as being significantly above average.

b) English language skills in accordance with the study qualification rules (*Studienqualifikationssatzung*) have to be submitted as part of the application for the Master's degree programme.

(2) The Chair of the Examination Board checks whether the admission requirements are met.

§ 10
Module 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 "compulsory modules", "technical compulsory elective modules", "lab courses" and "non-technical compulsory elective modules":

- Written examination (duration: maximum 180 minutes)
- Oral examination (duration: 30 to 45 minutes, depending on the candidate)
- Colloquium
- Experiment
- Practical task
- Demonstration
- Paper
- Protocol
- Work report
- Written report
- Interview and interview report
- Online tests
- Presentation

Individual details about the examinations to be completed for each module can be found in the module overview in the appendix. 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) In accordance with Section 8 (1) and (2) of the version of the Examination Procedure Regulations from 21 February 2008, and on account of the corresponding resolutions of the Senate of Kiel University of 1 July 2009 and 22 July 2009, the written examinations mentioned in (1) take place in six consecutive weeks outside of the lecture period, immediately before the start of the lecture period. The period of time for carrying out the oral examinations listed in (1) covers the entire lecture-free period, plus the last week of the lecture period of the previous semester, plus the first two weeks of the lecture period of the next semester.

(3) 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.

§ 11
Examination prerequisites

(1) If a module contains lab courses or practical exercises, admission to the examination assumes regular participation in these courses.

(2) Participation in the "Communications Lab" module is considered regular if all the experiments in the module have been performed. Participation in the "Real-time Signal Processing Lab" and "Advanced Topics Lab" modules is considered regular if the student attends at least 80% of the sessions. If a student misses a session for reasons in Section 54 (4) HSG, the lecturer can give him or her a substitute date.

(3) Courses for which admission to the examination assumes regular participation are marked in the annex.

§ 12
Master's thesis

(1) The Master's thesis is intended to prove that the examination candidate is capable of independently addressing an issue from his/her subject using scientific methods.

(2) A candidate is admitted who still needs to complete one of the required examinations or study achievements (cf. Annex) at the most. In exceptional cases, admission by the Chair of the Examination Board is also possible upon a written application if more than one examination or study achievement is missing.

(3) It is recommended that students begin preparing the Master's thesis four weeks at the latest after successfully passing all module examinations.

(4) The student may hand a topic for the thesis back only once, without specifying reasons, within the first month of the preparation period. In this case, it is recommended to start working on a new thesis topic two weeks at the latest after returning the first topic.

(5) The Master's thesis will be issued and supervised by a professor or non-faculty lecturer involved in the degree programme of the Faculty of Engineering. The proper issuance will be certified by the Chairperson of the Examination Board and recorded in the files. If the Master's thesis is to be prepared at an institution outside of the Faculty of Engineering it requires approval by the Chairperson of the Examination Board.

(6) The period for completing the Master's thesis is six months.

(7) The examination candidate presents the findings of his/ her Master's thesis to the examiners in a presentation of around thirty minutes and explains them in more detail in a subsequent colloquium. Both the presentation and the colloquium are open to the university-affiliated public. The date for the presentation will be set by the supervising professor and must be a maximum of two weeks after submission of the thesis.

(8) The Master's thesis is evaluated by at least two examiners, one of whom must be the thesis supervisor.

(9) The evaluation of the thesis will occur after the presentation and colloquium. The evaluation of the Master's thesis considers the preparation, the written form, the oral presentation and the colloquium.

(10) The Master's thesis will be evaluated by both examiners within six weeks of submission.

(11) The Master's thesis is to be submitted to the responsible Examination Office in the form of two hard copies and additionally one copy in a form suitable for electronic data processing.

§ 13
Calculation of the final grade

(1) The final grade is calculated from the arithmetic mean of the section grades from the compulsory modules with a weighting of 34, from the technical optional modules with a weighting of 32 and the grade for the Master's thesis with a weighting of 22.

(2) The section grade from the compulsory modules is calculated from the arithmetic mean of the module grades in this section, weighted according to their ECTS credits.

(3) The section grade from the technical optional modules is calculated from the arithmetic mean of the module grades in this section, weighted according to their ECTS credits. Passed modules covering 32 ECTS credits are considered in descending grade order (from best to worst) – unless the student suggests a different order in writing before submission of the Master's thesis at the latest – and under consideration of the compilation of the technical optional modules as defined in § 3. If, in doing so, the total of 32 ECTS credits is exceeded due to the last module considered, this module will be fully considered according to the number of assigned ECTS credits when calculating the section grade.

§ 14
Entry into force, expiry, transitional provisions

(1) These Examination Regulations enter into force as of 1 October 2015. They apply for the first time to students who initially register for the WS 2015/2016 or later for the first or for a higher semester for this degree programme.

(2) At the same time, the previous degree-specific Examination Regulations (Rules) of the Faculty of Engineering for the Master of Science (M.Sc.) degree programme in "Digital Communications" at Christian-Albrechts-Universität zu Kiel of 14 May 2010 (Bulletin of the Ministry of Science, Economic Affairs and Transport of the Land Schleswig-Holstein (NBl. MWV Schl.-H. page 38), most recently amended by statute of 13 June 2013 (University Bulletin of the Ministry of Education and Science of the Land Schleswig-Holstein (NBl. HS. MBW Schl.-H., p. 54), cease to be in force.

(3) A qualification in accordance with the relevant degree-specific Examination Regulations is possible until 10 December 2017 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 Digital Communications, 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. If compulsory modules from the degree-specific Examination Regulations in accordance with Paragraph 2 are no longer offered, the Examination Board will name replacement modules.

(4) Students can apply to change to the new degree-specific Examination Regulations. Module examinations which have been completed and passed in full by the date these Examination Regulations enter into force will remain valid. Compulsory modules which have already been completed will be transferred with the ECTS credits listed in these degree-specific Examination Regulations.

(5) Students who continue their studies in accordance with the degree-specific Examination Regulations that expired in accordance with Paragraph 2 automatically change over to the new degree-specific Examination Regulations for the winter semester 2017/2018, provided obtaining the qualification in accordance with the previous degree-specific Examination Regulations before the deadline in Paragraph 3 can be excluded.

(6) If a student has completed and passed independent parts of a module examination, these will be recognised. 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 Examination Regulations entered into force will be set off against the number of attempts in accordance with the new Examination Regulations, provided the structure of the new module examinations permits recognition.

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

The University Board granted its approval in accordance with Section 52 (1) 1 of the Schleswig-Holstein Higher Education Act in its letter dated 14 May 2010.

Kiel, 14 May 2010

Professor Dr Franz Faupel
Dean of the Faculty of Engineering
of Christian-Albrechts-Universität zu Kiel

Article 2 of the amended Examination Regulations of 27 July 2017:

These Examination Regulations enter into force on the day following their publication.

Annex: Programme Schedule

Academic half-year	Module	V SWS[1)]	Ü SWS	PÜ SWS	SWS[1)]	ECTS
1	Digital Communications	3	2		5	7
	Advanced Signals and Systems	3	2		5	7
	Advanced Digital Signal Processing	2	1		3	4
	Information Theory and Coding I	2	1		3	4
	Communications Lab*			4	4	4
	Non-technical Optional Module I [1)]			4	4	6
	Total				24	32
2	Information Theory and Coding II	2	1		3	4
	Optical Communications	2	1		3	4
	Wireless Communications (DSP)	2	1		3	4
	Technical Optional Modules	6	3		9	12
	Real-time Signal Processing Lab*			2	2	4
	Total				20	28
3	Technical Optional Modules	10	5		15	20
	Non-technical Optional Module II	2			2	4
	Advanced Topics Lab*			6	6	6
	Total				23	30
4	Master's Thesis					30
	Total					30
Total		34	17	16	67	120

[1)] Non-technical Optional Module: In accordance with § 3 (3) of these Regulations, this is generally a compulsory German course in conjunction with the studies (studienbegleitend).

Glossary:

SWS = Semesterwochenstunden (weekly 45-minute teaching units for the duration of one semester (with 15 weeks per semester)
V - Vorlesung = lecture
Ü - Übung = exercises/tutorial
PÜ - Praktische Übung = practical exercises

Attendance at lectures is compulsory for all modules marked with a *.

Appendix Date: 07.03.2019
(not part of the Examination Regulations)

Module overview: Modules in the Digital Communications Master's degree programme

Table of contents:

1. Compulsory Modules (PNR 59001)

etit-506	Advanced Signals and Systems (PNR 60700)						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
1. Semester	1 Semester			Compulsory	None	7 / 210	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Advanced Signals and Systems	Lecture + Exercise	3 + 2	7	Compulsory	Written Examination (PNR 60710)	Graded	100 %
etit-509	**Advanced Digital Signal Processing (PNR 60100)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
1. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Advanced Digital Signal Processing	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 60110)	Graded	100 %
etit-510	**Information Theory and Coding I (PNR 60200)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
1. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Information Theory and Coding I	Lecture + Exercise	2 + 1	4	Compulsory	Written Examination (PNR 60210)	Graded	100 %
etit-511	**Information Theory and Coding II (PNR 60300)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Information Theory and Coding II	Lecture + Exercise	2 + 1	4	Compulsory	Written Examination (PNR 60310)	Graded	100 %
etit-512	**Wireless Communications (DSP) (PNR 60400)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Wireless Communications (DSP)	Lecture + Exercise	2 + 1	4	Compulsory	Written Examination (PNR 60410)	Graded	100 %
etit-513	**Optical Communications (PNR 60500)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Optical Communications	Lecture + Exercise	2 + 1	4	Compulsory	Written Examination (PNR 60510)	Graded	100 %

etit-514	Digital Communications (PNR 60600)						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
1. Semester	1 Semester			Compulsory	None	7 / 210	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Digital Communications	Lecture + Exercise	3 + 2	7	Compulsory	Written Examination (PNR 60610)	Graded	100 %

2. Technical Optional Modules (PNR 67501)

a) Applied Communications and Networks (PNR 62001)

etit-611	Numerical Simulation of Analog and Digital Communication Systems (PNR 83101)						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Numerical Simulation of Analog and Digital Communication Systems	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 83120)	Graded	100 %
etit-621	**Advanced Wireless Communications (DSP) (PNR 62100)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Advanced Wireless Communications (DSP)	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 62110)	Graded	100 %
etit-632	**Advanced Photonic Communication Systems (PNR 62300)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Advanced Photonic Communication Systems	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 62310)	Graded	100 %
etit-633	**Fiber-optic Communication Networks (PNR 62400)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Fiber-optic Communication Networks	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 62410)	Graded	100 %

b) Communication Devices (PNR 64001)

etit-515	**Digital Electronics (PNR 64300)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Digital Electronics	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 64310)	Graded	100 %
etit-616	**Microwave Filters: Theory, Design, and Realization (PNR 84900)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Microwave Filters: Theory, Design, and Realization	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 84910)	Graded	100 %
etit-620	**Underwater Techniques (PNR 85100)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Underwater Techniques	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 85110)	Graded	100 %
etit-625	**Photonic Components (PNR 64200)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Photonic Components	Lecture + Exercise	2 + 1	4	Compulsory	Presentation and Oral Examination (PNR 64210)	Graded	100 %
Inf-DSys	**Digital Systems (PNR 10400)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Digital Systems	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 10410)	Graded	100 %

c) Applied Signal Processing (PNR 66001)

etit-520	Neuromorphic Engineering (PNR 81100)						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Optional	None	6 / 180	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Neuromorphic Engineering	Lecture + Exercise	2,5 + 1,5	6	Compulsory	Written or Oral Examination (PNR 81110)	Graded	100 %
etit-523	**Optimization and Optimal Control (PNR 81400)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	6 / 180	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Optimization and Optimal Control	Lecture + Exercise	3 + 1	6	Compulsory	Oral Examination (PNR 81410)	Graded	100 %
etit-603	**Introduction to Radar Signal Processing and Algorithms (PNR 84600)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Introduction to Radar Signal Processing and Algorithms	Lecture + Exercise	2 + 1	4	Compulsory	Written Examination (PNR 84610)	Graded	100 %
etit-614	**Applied Nonlinear Dynamics (PNR 84700)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Applied Nonlinear Dynamics	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 84710)	Graded	100 %
etit-617	**Adaptive Filters (PNR 66100)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Adaptive Filters	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 66110)	Graded	100 %

etit-618	**Pattern Recognition and Machine Learning (PNR 83602)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Pattern Recognition and Machine Learning	Lecture + Exercise	2 + 1	4	Compulsory	Written Examination (PNR 83630)	Graded	100 %
etit-636	**Digital Audio Effects (PNR 62700)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Optional	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Digital Audio Effects	Lecture + Exercise	2 + 1	4	Compulsory	Oral Examination (PNR 62710)	Graded	100 %
etit6024-01a	**Fundamentals of Acoustics (PNR)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Optional	None	5 / 150	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Fundamentals of Acoustics	Lecture + Exercise	3 + 1	5	Compulsory	Oral Examination (PNR)	Graded	100 %
Inf-MMCom	**Multimedia Communications (PNR 10200)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. or 3. Semester	1 Semester			Optional		4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Multimedia Communications	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 10210)	Graded	100 %
Inf-EmSysDes	**Embedded System Design (PNR 10300)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. or 3. Semester	1 Semester			Optional		4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Embedded System Design	Lecture + Exercise	2 + 1	4	Compulsory	Written or Oral Examination (PNR 10310)	Graded	100 %

3. Lab Courses (PNR 67600)

etit-705	**Communications Lab (PNR 68000)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
1. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Communications Lab	Practical Exercise	4	4	Compulsory	Colloquia and Practical Tasks (PNR 68010)	Not Graded	-
etit-708	**Real-time Signal Processing Lab (PNR 68100)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
2. Semester	1 Semester			Compulsory	None	4 / 120	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Real-time Signal Processing Lab	Practical Exercise	2	4	Compulsory	Practical Task, Presentation and Written Report (PNR 68110)	Graded	-
etit-706	**Advanced Topics Lab (PNR 68200)**						
Semester	**Duration**			**Status**	**Entry Requirements**	**ECTS Credits / Workload**	
3. Semester	1 Semester			Compulsory	None	6 / 180	
Module Courses	**Teaching Method**	**Contact Time**	**ECTS Credits**	**Status**	**Examination**	**Evaluation**	**Weighting**
Advanced Topics Lab	Practical Exercise	6	6	Compulsory	Practical Task, Presentation and Written Report (PNR 68210)	Graded	100%