

This is a translation of the original document in the German language. For all legal purposes, solely the German version of the examination regulations shall be considered binding.

**Examination regulations**  
**for the Master's program in**  
**Communication Systems and Networks**  
**conferring the degree**  
**Master of Science**  
**of the Faculty of Information, Media and Electrical Engineering**  
**at Cologne University of Applied Sciences**

**of**  
**July 8, 2013**

By virtue of section 2 (4) and section 64 (1) of the North Rhine-Westphalia Higher Education Act (*Gesetz über die Hochschulen des Landes Nordrhein-Westfalen*) of October 31, 2006 (GV. NRW. p.474), last altered by law on January 31, 2012 (GV.NRW. p. 90), Cologne University of Applied Sciences has determined the following examination regulations by statute:

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## **I. General information**

### **Section 1 Applicability of the examination regulations; catalog of modules and curriculum**

(1) These examination regulations are to administer the studies and examinations in the Master's program in Communication Systems and Networks at Cologne University of Applied Sciences. The Master's program is offered in cooperation with Bonn-Rhein-Sieg University of Applied Sciences.

(2) Based on these examination regulations, Cologne University of Applied Sciences is to create a curriculum (see annex 1) and a catalog of modules. Taking into account developments in the fields of science and university teaching as well as profession-specific requirements, both the curriculum and the catalog of modules are to outline the course contents and structure of the Master's program. The curriculum is to provide students with a guideline for adequately scheduling their studies.

### **Section 2 Objectives of the program; purpose of the examinations; degree conferred**

(1) By passing the Master's examination, graduates are awarded a second university degree qualifying them to exercise professional work in the field relevant to the program and entitling them to admission to doctoral/PhD-level studies in accordance with section 67 (4) sentence 1 letter c) of the North Rhine-Westphalia Higher Education Act.

(2) By deepening and enhancing the technical and methodological knowledge, skills and methods taught during Bachelor-level studies while observing the general study objectives (section 58 of the North Rhine-Westphalia Higher Education Act), the Master's program (section 4) is designed to enable students to deal with complex issues, to critically analyze scientific findings, to independently conduct scientific work, to engage in scientific discourse in their own and in related disciplines and to act responsibly. In particular, the program is to take into account current needs and foreseeable developments in the professional world and pay attention to interdisciplinary aspects.

(3) The module examinations including the Master's thesis (section 6) are to determine whether students have attained sound specialized knowledge required to exercise work in their profession independently and whether they are capable of independently exercising work and conducting research on the basis of scientific findings and methods.

(4) The Master's program is consecutive to the Bachelor's programs in Electrical Engineering and Computer Engineering at Cologne University of Applied Sciences or to the Bachelor's program in Computer Science at Bonn-Rhein-Sieg University of Applied Sciences.

(5) By passing the examinations listed in section 4, students will have completed a scientific degree program, allowing them to exercise work in the designated profession. Based on the successful completion of all examinations, Cologne University of Applied Sciences is to confer the academic degree Master of Science in accordance with the regulations stated hereinafter.

### **Section 3 Admission requirements; determination of eligibility**

(1) Successful applicants are required to have obtained a recognized undergraduate degree in a suitable scientific or technological field, having obtained at least 210 credits in accordance with the European Credit Transfer System (ECTS) and a final cumulative grade of 2.5 or better in the German grading system or equivalent. The degree is to provide proof of the previous academic background required for the Master's program. University degrees will be recognized if they have been approved

by the responsible public authority of the country in which the university is based, or if they have been accredited in a state-recognized procedure.

(2) A degree program is deemed suitable in accordance with subsection 1 if it teaches competencies in the fields of mathematics, physics, electrical engineering and computer science comprising a total of at least 110 credits.

(3) If applicants do not meet all requirements stipulated in subsections 1 and 2, they can only be admitted under the condition that they will be able to attest to the missing prerequisites before registering for the Master's thesis by having successfully completed specific courses offered in Bachelor's programs. This normally happens if an applicant has obtained fewer than 210 credits or fewer than 110 credits pursuant to subsection 2 in his/her undergraduate program. The nature and scope of these conditions are individually determined by the examination board based on the courses completed by the applicant in his/her undergraduate program. Admission to the Master's program will be denied if the applicant has obtained fewer than 80 credits pursuant to subsection 2 or a final cumulative grade of worse than 2.5 pursuant to subsection 1.

(4) Applicants who have not yet completed the undergraduate degree mandated in subsection 1 may - provided that they are enrolled in a suitable program in accordance with subsection 2 - be admitted to the Master's program if they can prove at the point of application that no more than 30 credits are required in order for them to successfully graduate in this undergraduate program. In such cases, applicants are to be enrolled under the condition that the completion of the undergraduate program with the minimum final cumulative grade stipulated in subsection 1 will be attested to by the end of the re-registration deadline for the semester following their enrollment.

(5) Applicants who possess the qualifications stated in subsection 1 and have additionally acquired knowledge and skills in ways other than university studies are to be admitted to a stage of the program that corresponds to the results of the placement test pursuant to section 49 (11) of the North Rhine-Westphalia Higher Education Act, unless regulations on admission procedures conflict with this provision. Details are stipulated in the regulations on placement exams of Cologne University of Applied Sciences.

(6) The predominant language of instruction in the Master's program is to be English. Applicants therefore need to meet one of the following requirements:

- a) Having passed the TOEFL with at least 550 points on the paper-based test, 213 points on the computer-based test or 80 points on the internet-based test.
- b) Having passed the IELTS with 6.5 points.
- c) Having passed an alternative language test with a test score equivalent to those of TOEFL and IELTS.
- d) Prior enrollment of at least one year in a university program conducted entirely in English.
- e) Prior schooling of at least one year conducted entirely in English.
- f) Completion of a suitable degree program which includes courses in Technical English comprising at least 3 credits. This specifically includes the degree programs in Electrical Engineering and Computer Engineering at Cologne University of Applied Sciences.
- g) English as a mother tongue. Students may provide evidence of their English language proficiency within the first semester of the Master's program.
- h) When electing profiles which include German-language modules, students additionally are to attest to having passed the German Language Proficiency Test for Admission of Foreign Students (DSH 1<sup>st</sup> level) if they have not obtained their higher education entrance qualification at a German-language institution.

(7) Admission is to be denied if the applicant has irreversibly failed the Master's examination in Communication Systems and Networks within the jurisdiction of the German constitution or if he/she has lost the right to take examinations in this degree program. Admission is also to be denied if the applicant has - within the jurisdiction of the German constitution - irreversibly failed a comparable examination in a comparable Master's program which is equivalent to a mandatory examination in this Master's program, or if he/she has lost the right to take said examination.

#### **Section 4 Standard program duration; scope of the program; internationalization**

- (1) The standard duration of the Master's program is three semesters. In compliance with the European Credit Transfer System (ECTS), students are awarded a total of 90 credits (section 12). The standard duration of the program includes the examination period.
- (2) The program is segmented into individual modules. Detailed information can be found in section 23 and the curriculum (annex).
- (3) Students begin the first semester of the Master's program at CUAS in either the summer or winter semester.
- (4) The predominant language of instruction in the Master's program in Communication Systems and Networks is to be English.
- (5) The program is to support the incorporation of practical semesters at a university abroad. Up to 30 credits obtained abroad may be transferred to the Master's program. The examination board is to decide on all credit transfers.

#### **Section 5 Scope and structure of examinations; examination deadline**

- (1) A student's successful completion of the program is to be determined by the examinations taken throughout the program (module examinations). Group examinations are admissible.
- (2) Module examinations are to be held when the corresponding module has been concluded according to the curriculum. The curriculum is to guarantee that the student can have taken all module examinations by the end of the third semester.
- (3) The examinations are to make allowance for the legal provisions for maternity and parental leave periods as well as the leave for the nursing and care of spouses, registered partners, relatives in direct line of descent or brothers and sisters-in-law if they are in need of nursing or care.

#### **Section 6 Examination board**

- (1) The Faculty of Information, Media and Electrical Engineering is to establish an examination board to be in charge of the organization of examinations and the arrangement of the duties entrusted to it by these examination regulations. The examination board is to be an independent body of the faculty.
- (2) The examination board is to be made up of eight persons:
  1. chairperson and vice chairperson selected from the pool of faculty professors;
  2. two additional members selected from the pool of faculty professors;
  3. one member selected from the pool of research assistants or lecturers
  4. two members selected from the pool of students.
  5. the program commissioner at Bonn-Rhein-Sieg University of Applied Sciences

The members listed in 1 to 4 are to be elected by the faculty council of the Faculty of Information, Media and Electrical Engineering at Cologne University of Applied Sciences.

- (3) Deputies are to be elected for all members of the examination board except for the chairperson and the vice-chairperson. The members of the board employed in full-time positions at the university

and their deputies have tenure of two years; the student members and their deputies have tenure of one year. Re-election is permissible.

### **Section 7 Rights and duties of the examination board**

- (1) The examination board is to be responsible for the organization of examinations. It is also to ensure that the examination regulations are complied with and that examinations are conducted properly. In particular, it is to rule on objections brought forward against decisions that were made in exam-related matters.
- (2) Moreover, the board is to report to the faculty council on developments related to examinations and the duration of studies, if so requested. It is to give advice on potential reforms of the examination regulations, the catalog of modules and the curricula. The examination board may transfer its regular duties to the chairperson of the examination board; this does not apply to decisions on objections.
- (3) The members of the examination board and a representative of the President's Office have the right to be present during examinations. Exempt from this right are student members of the examination board who are to take the examination concerned during the very same examination period.
- (4) Sessions of the examination board are not open to the public.

### **Section 8 Decisions by the examination board**

- (1) The examination board has a quorum if, in addition to the chairperson or vice-chairperson, a member from the pool of professors and at least two additional members eligible to vote are present. Decisions require a simple majority. In case of a tie, the chairperson is to have the casting vote. Student members and research assistants do not have a say in decisions on matters related to education and academics, particularly when it comes to the recognition or other evaluation of examinations and assessments or the appointment of examiners or co-examiners. Moreover, student members are not to participate in the debate and decision-making on matters related to examination topics or their own examinations.
- (2) The members of the examination board, their deputies, the examiners as well as co-examiners are to be sworn to official secrecy. If they are not employed in the German civil service, they are to be sworn to secrecy by the chairperson of the examination board.
- (3) Incriminating decisions of the examination board or its chairperson are to be reported to the affected student immediately. Prior to any action, the affected student has to be granted the right to be heard.

### **Section 9 Examiners and co-examiners**

- (1) The examination board is to appoint the examiners and co-examiners. A person may be appointed examiner if he or she holds at least the qualification that is to be determined by the examination or an equivalent qualification and – provided that no compelling reasons necessitate a divergence – has held an independent teaching position in the subject relevant for the examination. A person may only be appointed co-examiner if he/she has at least passed the corresponding Master's examination or a comparable examination or holds a comparable qualification (competent co-examiner). Examiners are independent for examination purposes.

(2) The examination board is to ensure that examination duties are split as evenly as possible amongst the examiners. The chairperson of the examination board is to ensure that the student will be informed about his or her examiner in time. This shall happen simultaneously to the registration for the examination, i.e. usually at least two weeks before the examination is held or before the topic of the Master's thesis is assigned. Posting the information on the corresponding bulletin board or on an electronic examination management portal is deemed sufficient.

## **Section 10 Recognition of examinations and assessments**

(1) Examinations and assessments completed in the same degree program within the jurisdiction of the German constitution are to be officially recognized.

(2) Examinations and assessments completed in other degree programs within the jurisdiction of the Convention on the Recognition of Qualifications concerning Higher Education in the European Region of April 11, 1997 (Federal Law Gazette (BGBl) II 2007; p. 712 - Lisbon Recognition Convention) are to be officially recognized if it can be proven that they do not considerably differ from the examinations and assessments required. If the recognition of such examinations and assessments is denied, the university is to issue a substantiated notification on this matter.

(3) Examinations and assessments completed in degree programs outside the jurisdiction of the Lisbon Recognition Convention are to be recognized upon request if they are equivalent to the examinations and assessments required.

(4) Accomplishments that are not part of a degree program may be recognized as examinations or assessments upon request if they are equivalent to the examinations and assessments required. Such accomplishments may at most be recognized with up to half of the total number of examinations and assessments required for the successful completion of the program.

(5) For examinations and assessments that have been recognized, students are awarded the number of ECTS credits stipulated in the curriculum (cf. annex 1). Non-graded examinations taken at other universities or in other programs are to be recognized in accordance with sections 1 to 3. They are to be indicated accordingly on the examination certificate and are not accounted for in the calculation of the final cumulative grade.

## **Section 11 Evaluation of examinations**

(1) Examinations may be graded or non-graded. They are to be evaluated in a comprehensible manner. Reasons for the evaluation are to be explained in writing upon request of the examination board. The evaluations of the individual examinations are to be determined by the respective examiner.

(2) Examinations comprise all of the program's module examinations. This may include the individual module components listed in the catalog of modules. Individual examinations may be taken in several stages. If a module examination is made up of several components, its grading may either be based on the grades awarded for the individual components or on the total number of points scored in the individual components.

(3) If several examiners participate in an examination, the examiners are to jointly evaluate the examination, provided that no other provisions are made hereinafter. Should the evaluations differ from one another, the grade is to be determined by the arithmetic mean of the individual grades.

(4) The following grades are to be used for the evaluation of graded examinations:



1.0/1.3	=	excellent	=	an excellent examination
1.7/2.0/2.3	=	good	=	an examination well above average requirements
2.7/3.0/3.3	=	satisfactory	=	an examination that meets average requirements
3.7/4.0	=	sufficient	=	an examination that meets the requirements despite its shortcomings
5	=	insufficient	=	an examination that does not meet the requirements due to substantial shortcomings

The grades 0.7, 4.3, 4.7 and 5.3 are invalid.

(5) Calculated grades that differ from the grades listed above are to be determined as follows.

Figures:

up to 1.5	equal the grade	"excellent"
above 1.5 to 2.5	equal the grade	"good"
above 2.5 to 3.5	equal the grade	"satisfactory"
above 3.5 to 4.0	equal the grade	"sufficient"
above 4.0	equal the grade	"insufficient"

When it comes to the calculation of grades, only the first decimal is to be factored in; all other decimals are to be dropped without rounding.

(6) Non-graded examinations are to be evaluated with either "passed" or "not passed".

(7) An examination is passed if the student's performance is deemed at least "sufficient" or "passed". If an examination is made up of several graded components, these components are to be merged into one single grade. An examination is deemed passed if the overall grade is at least "sufficient" and all non-graded examinations have been "passed".

(8) The evaluation of examinations is to be completed within six weeks' time. Students are to be informed about the results; posting the results on the corresponding bulletin board or on an electronic examination management portal is deemed sufficient. The results of the Master's thesis are to be reported to the students within eight weeks.

## **Section 12 Credits in accordance with the ECTS (European Credit Transfer System)**

(1) Credits are to be assigned to every module of the Master's program, enabling recognition in accordance with the European Credit Transfer System (ECTS). The credits are a quantitative measure of the workload that averagely gifted students typically need to successfully complete a component of the program. This workload includes courses, preparation and follow-up work of a course, autodidactic study as well as examinations and preparation for examinations.

(2) The workload required to successfully complete the Master's program as laid down in the curriculum amounts to 60 credits per academic year on average. 1 credit corresponds to a workload of 30 hours.

(3) Students only receive credits if they have successfully completed a module. Pursuant to section 11 (7), this means that students are awarded the total number of credits for every module examination that has been passed or graded with at least "sufficient", irrespective of the grade received for the examination. A total of 90 credits are required to successfully graduate in the Master's program.

(4) The curriculum (cf. annex 1) gives an overview of the number of credits assigned to the individual modules. More detailed information can be found in the catalog of modules.

- (5) Complying with section 10 (1), credits obtained in accordance with the ECTS at other universities within and outside the jurisdiction of the German constitution are to be recognized with at most the number of credits assigned in the current program.

### **Section 13 Evaluation of examinations in accordance with the ECTS grading scheme**

The certificate awarded to graduates in accordance with section 31 (1) is to list ECTS grades as well. Details are to be determined at a later point in time based on the decisions made at the Standing Conference of the Ministers of Education and Cultural Affairs of the German *Länder* and the German Rectors' Conference.

### **Section 14 Retaking examinations; supplementary oral examination**

(1) If a module examination was not passed or is considered "not passed", students may retake this examination twice at most. Differing from this provision, the Master's thesis and final oral examination may only be retaken once. Module examinations which have been passed may not be retaken unless one of the cases mentioned in subsection 3 applies. If an examination is not passed or considered "not passed", the student will be automatically registered for the exam held in the following examination period. Section 17 (6) applies accordingly.

(2) If a module examination is made up of several components, only those components that have not been passed need to be retaken in case of a failed attempt.

(3) When having passed a module examination in its first attempt, students are to be granted the opportunity to register for this module examination again in order to improve their grade (grade improvement exam). Students may make use of this option for a maximum of three modules throughout their studies and once per module at the most. If a module examination is made up of several graded components, only one component may be retaken. Students are required to register for the grade improvement exam for the exam date which immediately follows the first examination attempt. When making use of this provision, the better of the two grades is to be counted. This provision cannot be employed for the Master's thesis and final oral examination.

(4) If a student's second retake of a written examination is graded "insufficient" (5.0) and if the reasons for awarding this grade do not include cheating, absence or withdrawal without good reason pursuant to section 15 (1 and 3), the student is upon written request to be granted the opportunity to take a supplementary oral examination prior to recording the grade "insufficient". Students may make use of this provision a maximum number of two times during the course of the program. Section 21 applies accordingly for conducting a supplementary oral examination. Based on the supplementary oral examination, the exam will be graded either "sufficient" (4.0) or "insufficient" (5.0).

### **Section 15 Absence; withdrawal from examinations; cheating**

(1) An examination is deemed "insufficient" (5.0) or "not passed" if the student does not appear for an examination and is not able to present a good reason for his/her absence. An examination is also deemed "insufficient" or "not passed" if the student withdraws from it without good reason after the examination has begun or if he/she does not submit the examination by the time stipulated. The provisions stated above also apply if the student does not submit his/her Master's thesis in due time.

(2) The reasons stated for missing or withdrawing from an examination are to be immediately reported to the examination board, to be documented in writing and to be substantiated by the student. In case of sickness, students are required to submit a comprehensible medical certificate attesting to their incapability of taking the examination. If the examination board accepts the reasons

given, the student is to be notified that he/she may again file a request to be admitted to the examination concerned.

(3) If a student attempts to manipulate the result of his/her examination by cheating or by using non-permissible means, the examination concerned is to be graded "insufficient" (5.0) or "not passed". A student who disrupts the proper course of an examination may be expelled from the examination by the examiner or the invigilator after having been given prior warning; in such a case, the examination concerned is to be graded "insufficient" (5.0) or "not passed". The reasons for the expulsion are to be put on record. If the student is barred from retaking the examination, he/she may request the examination board to review this decision. This also applies to the decisions made by an examiner or an invigilator, such as the ones laid down in sentence 1. Possible penalties as set down in section 63 (5) of the North Rhine-Westphalia Higher Education Act are to be acknowledged.

(4) Non-permissible means are all documents and resources not explicitly allowed to the examination concerned. Students are required to indicate other people's intellectual property (text passages, images, statistics, etc. by other authors from offline or online sources) adopted in their written papers or examinations as quotations. Whether an examination may be retaken in cases of alleged plagiarism may be subject to meeting certain conditions, such as the successful participation in a seminar or workshop on academic writing techniques. In cases of multiple or particularly serious attempts of cheating, the examination board may determine that the examination will be deemed irreversibly failed.

## **II. Module examination**

### **Section 16 Objectives, length and type of module examinations**

(1) The Master's program is divided into individual modules, each of which concludes with an examination. The content of a module may be taught in one or more courses with different methods of teaching and study. A module normally takes place for the duration of one semester (or, if need be, for the duration of two semesters at the most). A module examination may be subdivided into several individual examinations with the same or differing types of examination pursuant to sections 19 to 22. The examinations are to determine if and in which quality students have acquired the competencies stated in the modules' learning objectives.

(2) On the basis of the courses offered, the examination requirements are to be aligned with the learning outcomes defined for the individual module, which are outlined in the catalog of modules. Students may be required to be familiar with relevant contents of previous modules. Courses and examinations may also be held in English. Details are available in the catalog of modules.

(3) A module's type of examination depends on the requirements of the individual module. Admissible types of examination are written examinations (sections 19 and 20) of 60 to 120 minutes duration, oral examinations (section 21) of 10 to 30 minutes duration per student and other types of examination (section 22) as well as combinations of the aforementioned types of examination. If written or oral examinations are made up of several components, a student's total workload is not to exceed the workload stated in sentence 1.

(4) After consultation with the examiners concerned and in observance of the module outline and the feasibility to complete the program within the allotted time frame, the examination board is to determine the type and modalities of examination for every module at the beginning of each semester. If an examination within a module comprises several components or a combination of different types of examination, the examination board is also to specify how to weight the individual components. If no specific weighting has been established, the final cumulative grade is to be determined based on the arithmetic mean of the individual evaluations.

(5) The examination board normally determines the examination period for written and oral examinations at the beginning of the semester that precedes the examination period for all students who intend to take the module examination concerned. The examination board's decision is to be uniform and binding. Posting the information on the corresponding bulletin board or on an electronic examination management portal is deemed sufficient. For scheduled examination dates, the regulations stipulated in section 18 (1) apply.

(6) If other types of examination (course-accompanying exams) have been determined, the examiner is to determine the schedule of examinations in the first quarter of the course concerned. The examiner is to publish the schedule of examinations within this period. Posting the information on the corresponding bulletin board or on an electronic examination management portal is deemed sufficient. Section 18 (1) does not apply.

## **Section 17 Admission to module examinations**

(1) Students are to register for examinations within the registration period stipulated by the examination board via the electronic registration/deregistration process provided by the Office of Student and Examination Services. Under specific circumstances, students may alternatively file a written registration with the Office of Student and Examination Services. Students are required to verify that their registration has been properly recorded and that they have been admitted to the exam by consulting the appropriate registration lists. Only registered students may take part in an examination. Admission to the module examination is a prerequisite for participating in the course-accompanying exam components. If a module examination is made up of course-accompanying as well as concluding exam components, passing the course-accompanying components is a prerequisite for taking the concluding components. The registration as stated in sentence 1 may only be voided prior to the end of a deadline stipulated by the examination board (orientation period). In such cases, students will be barred from the continued participation in the course-accompanying exam components for the semester in question. Students are to be given the opportunity to withdraw from an examination even after expiration of the orientation deadline (subsection 6).

(2) Students may only be admitted to an examination if they

1. are enrolled or registered at Cologne University of Applied Sciences as current students
2. are cross-registered students pursuant to section 52 (1 and 2) of the North Rhine-Westphalia Higher Education Act and have neither taken an examination in the subject concerned as regular students nor have they registered for one.

(3) Students may be required to pass other module examinations in order for them to be admitted to a module examination; see section 24 and the curriculum (annex) for detailed information.

(4) The optional required modules (*Wahlpflichtmodule*) in which the student intends to take an examination and which are stated in the examination registration become binding with the registration. For all other relevant matters, the regulations set down in subsection 6 apply.

(5) Students are required to include the following documents with the registration or hand them in by a date set by the examination board, unless they have already done so previously:

1. proof of having met the admission requirements stated in subsections 2 and 3
2. a statement on previous relevant examination attempts as well as on previous endeavors to take the Master's examination in the same program.
3. a statement on whether the student objects to the presence of an audience during oral examinations

If the student cannot submit one of the documents required according to sentence 1 in its intended form, the examination board may allow him/her to provide the corresponding proof in a different manner.

(6) Except in cases involving other types of examination (section 22), a student who has been admitted to a module examination may revoke the registration for this examination in writing with the Office of Student and Examination Services or - if activated - via the electronic registration/deregistration process provided by the Office of Student and Examination Services up until one week prior to the set examination date without stating his/her reasons for doing so. By doing so, students will not be charged with an additional examination attempt. By deregistering from an examination, students will automatically be registered for the exam held in the following exam period. This holds true for students who have brought forward good reasons for their deregistration (section 15 (2)).

(7) Admission to a module examination is to be decided upon by the chairperson of the examination board and, in cases of doubt, the examination board itself.

(8) Admission is to be denied if

- a) the student does not meet the requirements stated in subsections 2 to 4
- b) the documents are incomplete and the student does not submit the remaining ones by the date set by the examination board
- c) the student has irreversibly failed a corresponding examination in a comparable program or has irreversibly failed a Master's examination in the same program within the jurisdiction of the German constitution.

In all other cases, admission is only to be denied if the student has, within the jurisdiction of the German constitution, lost the right to take examinations in the same program.

## **Section 18 Conduct of module examinations**

(1) For the module examinations specified in sections 19 and 20, normally one examination date per semester is to be scheduled. The examinations are to be held within the examination periods stipulated by the examination board and to be announced at the beginning of the semester or towards the end of the previous semester. No courses are to be held during the examination period.

(2) Students are to be informed about the individual examination dates and about their admission to the examinations in time - usually at least two weeks prior to the examination concerned. Posting the information on the corresponding bulletin board or on an electronic examination management portal is deemed sufficient.

(3) Upon request, students are obliged to identify themselves with an official photo ID.

(4) If a student – by submitting a medical certificate or in a different manner - substantiates that he/she is not capable of completely or partly taking the examination or assessment in its intended form due to a permanent disability or chronic disease pursuant to section 3 of the German Act on Equal Opportunities for Disabled Persons (*Behindertengleichstellungsgesetz*), the chairperson of the examination board may extend the time frame allotted for writing an examination or the deadline for taking an examination. The chairperson may also allow the student to take an equivalent examination in a different form. If several equivalent ways of offsetting a disabled person's disadvantage come into question, the chairperson of the examination board is to decide on the type, date and duration of the examination at his/her discretion after having duly considered all circumstances. This provision also applies to assessments and admission tests. In exceptional cases, sentences 1 to 4 also apply to persons with temporary health impairments. Request to offset a disabled person's disadvantage are to be filed in time before the individual examination.

(5) Retaken examination attempts whose passing is a prerequisite for continuing a program are to be evaluated by a minimum of two examiners.

## **Section 19 Written examinations (*Klausuren*)**

- (1) In written examinations the student is to prove that – within a limited time frame and with limited resources – he/she is capable of identifying and correctly solving problems stemming from areas covered by the module by means of common scientific methods of his/her subject field.
- (2) A written examination is to be held under supervision. It is the examiner's responsibility to decide as to whether students may use additional resources.
- (3) A written examination is normally drawn up by one examiner only. In specific cases, especially when a module examination covers several subject fields, the examination may also be drawn up by more than one examiner. In such a case, the examiners prior to the examination jointly determine how the individual components of the examination shall be weighted; each examiner is to evaluate the entire written examination irrespective of the individual components and their weighting. Due to the special character of a subject field, the examination board may alternatively determine that an examiner shall only evaluate the part of a written examination that corresponds to his/her subject field. In such a case, the examination is to be evaluated based on the previously determined weighting of the individual components. Section 18 (5) is to remain unaffected.
- (4) Examinations held by means of electronic equipment are to be treated like written examinations.

## **Section 20 Written multiple-choice examinations**

- (1) Written examinations may be completely or partly held as multiple-choice examinations. In multiple-choice examinations, students are asked to answer questions in writing and under supervision by selecting the correct answers from a list of suggested solutions. Multiple-choice examinations may be held in modules suitable for this type of examination upon request by the examiners and with approval of the examination board.
- (2) The questions asked in multiple-choice examinations are to be geared to the knowledge and skills taught in the module concerned and need to ensure reliable examination results.
- (3) It is the examiners' responsibility to determine the examination questions and the suggested solutions (examination exercises). It is to be recorded in writing which of the suggested solutions are to be accepted as correct answers.
- (4) The evaluation of a multiple-choice examination is to include the following information:
  1. the number of questions asked and the number of questions answered correctly by the student,
  2. the minimum number of questions required to be answered correctly in order to pass the examination,
  3. in case the examination has been passed, the percentage by which the number of correctly answered questions exceeds the minimum requirements,
  4. the grade obtained by the student.
- (5) When correcting the examinations, examiners are to pay attention as to whether a frequent occurrence of wrong answers to a specific question might indicate that the question was worded incorrectly. If it is determined after the examination that individual questions or possible solutions are erroneous, the examination exercises concerned will not be factored in. As a consequence, the number of examination exercises is to be reduced. This reduced number of exercises is to form the basis of the evaluation. Reducing the examination exercises may not put students at a disadvantage.

## **Section 21 Oral Examinations**

- (1) Oral examinations are to be held in the presence of an examiner and a competent co-examiner (section 9 (1)) or in the presence of several examiners (panel examination) as group examinations or individual examinations. If an examination covers several subject fields, every student will on principle be examined by only one examiner in each subject field unless section 18 (5) applies. Prior to grading the examination, the examiner is required to consult with the co-examiner or the other examiners.
- (2) Minutes are to be kept about the essential topics and results of the examination and the course of the exam, in particular about facts that are essential for the grading of the examination. The grade is to be reported to the students after the examination.
- (3) Students enrolled in the same program are to be given the opportunity to be present at oral examinations as audience, provided that there is enough space and that no student has objected to this provision when registering for the examination. Students may neither be present during the examiners' consultation nor during the announcement of examination results.

## **Section 22 Other types of examination**

- (1) Besides written and oral examinations, written and oral reports may also function as other types of module examination. These include in particular oral presentations, term papers, project papers and internship reports. They are normally taken as course-accompanying examinations.
- (2) Other types of examination are usually evaluated by one examiner, unless one of the provisions set down in section 18 (5) applies.
- (3) A term paper (e.g. a case study or research paper) is to determine whether the student is capable of independently completing a written technical assignment within a given time frame, using scientific and subject-related methods. The examiner is to determine the topic and length of the paper (e.g. number of pages of the main part) at the beginning of the semester. The grade given for the term paper is to be announced to the student three weeks after the term paper was submitted at the latest.
- (4) An oral report (e.g. presentation, negotiation, mediation) is to determine whether the student is capable of independently solving and adequately presenting a practice-based assignment by means of verbal communication within a given time frame, using scientific and subject-related methods. The examiner is to determine the duration of the oral report at the beginning of the semester. Minutes are to be kept about facts that are essential for the grading of an oral report. The grade is to be announced to the student one week after the oral report at the latest.
- (5) Term papers and oral reports in the form of a joint team project may be treated as an examination if the individual student's contribution to be evaluated as an examination is clearly distinguishable and can be assessed accordingly. In order to verify the student's contribution, aspects such as passages, subject fields, page numbers (for term papers) or other objective criteria allowing for a clear distinction are to be indicated.
- (6) The examinations stated in subsection 1 may also be held by means of electronic equipment or via learning platforms.

### **III. Curriculum**

#### **Section 23 Modules and completion of the program; additional examinations**

- (1) In all compulsory modules, module examinations pursuant to one or several types of examination stipulated in sections 19 – 22 are to be held. The program's modules are listed in annex 1; the corresponding types of examination can be found in the catalog of modules, unless individually determined by the examination board (section 16 (4) sentence 1). Information on electing modules and courses during the advanced stage of the program can be found in the curriculum and is further explained in the catalog of modules.
- (2) The curriculum and the examination procedures are to be designed in a way that allows for the completion of all examinations to be held in accordance with the curriculum (annex 1) by the end of the third semester.
- (3) The student may take examinations in more modules than the ones required to gain the mandatory number of credits (additional modules). The results of these additional examinations may be listed on the examination certificate upon request of the student. However, they are not accounted for in the calculation of the final cumulative grade. In such a case, the student is to indicate on the registration for the Master's thesis as to which examinations are to serve as module examinations and which ones as additional examinations.

#### **Section 24 Module examinations**

- (1) The required modules are listed in annex 1.

### **IV. Master's thesis and final oral examination**

#### **Section 25 Master's thesis; purpose; topic; examiners**

- (1) The Master's thesis is to be submitted as a written paper. It is to provide evidence that the student is capable of independently completing an assignment on a subject pertaining to his/her field of study within a given time frame by elaborating on subject-related specifics as well as on interdisciplinary contexts and by making use of scientific and subject-related methods. When writing their Master's theses, students should take an interdisciplinary collaboration into consideration. Examiners from other faculties may be chosen as thesis advisers if the topic of the thesis so allows.
- (2) The topic of the Master's thesis may be determined by any professor who may be appointed as examiner in accordance with section 9 (1). This examiner may also function as thesis adviser. Upon request of the student, the examination board may also name an honorary professor or a qualified adjunct lecturer as thesis adviser in accordance with section 9 (1) if it has been determined that no professor of the faculty is able to function as thesis adviser for the intended topic of the Master's thesis. Students may write their Master's thesis at an institution outside the university if this institution



provides sufficient assistance and advice. Students are to be given an opportunity to make suggestions about the topic of their Master's thesis.

(3) Students may also suggest an examiner to be his or her thesis adviser. If possible, a student's suggestion is to be taken into consideration. The chairperson of the examination board is to ensure upon request that a student is provided with a topic for the Master's thesis in time.

(4) A Master's thesis may also be written as part of a joint team project if the individual student's contribution to be evaluated as examination is clearly distinguishable and can be assessed accordingly and if it complies with the requirements stated in subsection 1. In order to verify a student's contribution, aspects such as passages, page numbers or other objective criteria allowing for a clear distinction are to be indicated.

(5) The Master's thesis is to be written in the English language.

## **Section 26 Admission to Master's thesis**

(1) Students are permitted to write their Master's thesis if they meet the admission requirements stated in section 17 (2 and 5) and have, pursuant to section 12, obtained a total of 45 credits in the examinations required in accordance with section 24.

(2) The registration for the Master's thesis is to be addressed in writing to the chairperson of the examination board and to be submitted to the Office of Student and Examination Services. The registration is normally to be filed prior to the end of the second semester. Students are required to submit the following documents with their registration, unless they have already done so:

1. proof of having met the admission requirements stated in subsection 1
2. statement on previous endeavors to write a Master's thesis or another final examination and on endeavors to take the Master's examination
3. statement on which examiner is willing and able to prepare the topic of the Master's thesis and to function as thesis adviser
4. suggested topic of the Master's thesis
5. the definite stipulation of the electable module examinations
6. if applicable: proof of having passed the examinations required as prerequisite for being admitted to the program in accordance with section 3 (5)

(3) Students may revoke the registration for the Master's thesis in writing up until the day the decision on admission is announced. By complying with this provision, students will not lose an attempt to write the Master's thesis.

(4) Admission to the Master's thesis is to be granted by the chairperson of the examination board and, in cases of doubt, the examination board itself. Admission is to be denied if

- a) the student does not meet the requirements stated in subsection 1, or
- b) the documents to be submitted are incomplete, or
- c) within the jurisdiction of the German constitution, a final thesis written by the student has been evaluated as "insufficient" and may not be written again, or if the student has irreversibly failed one of the examinations stated in subsection 2 sentence 3 no. 2.

In all other cases, admission is only to be denied if the student has, within the jurisdiction of the German constitution, lost the right to take examinations in the same program by for instance having failed to meet a deadline for retaking examinations.

## **Section 27 Assignment of the topic and completion of the Master's thesis**

- (1) The topic of the Master's thesis is to be assigned by the chairperson of the examination board. The time of assignment is to be the day on which the chairperson of the examination board informs the student about the topic of the Master's thesis assigned by the thesis adviser; the time of assignment is to be put on record.
- (2) Students have five months to write the Master's thesis (starting with the time of assignment to the day of submission). The topic and assignment must be designed in a way that allows for the Master's thesis to be completed within the allocated time frame. In exceptional cases, the chairperson of the examination board may extend the deadline of submission by up to six weeks if the student concerned submits a request prior to the deadline, in which he/she is to justify the reasons for extending the deadline. The thesis adviser is to be consulted on the request. The main part of the Master's thesis is to comprise approximately 80 pages.
- (3) Students may withdraw from a topic of their Master's thesis only once and may only do so within the first four weeks of the assigned time frame, without stating their reasons for doing so. If a student undertakes a second attempt to write a Master's thesis in compliance with section 14 (2), the student is only permitted to withdraw from the thesis if he/she did not do so during the writing of his/her first Master's thesis.
- (4) Section 18 (4) applies accordingly.

## **Section 28 Submission and evaluation of the Master's thesis**

- (1) Students are to submit the Master's thesis to the chairperson of the examination board or at a location determined by the chairperson by the deadline of submission. The thesis is to comprise:
  - a) three hardcover copies of the thesis
  - b) one electronic copy in one of the common word processing formats on a data storage device
  - c) an abstract of the thesis of no more than 100 words in German and English as paper and electronic copy
  - d) a technical report of the thesis in German and English of 4 to 8 pages length in an electronic form to be determined by the examination board
  - e) if applicable: additional material pertaining to the thesis, such as program code or data, on an electronic storage device

The examination board may stipulate regulations on details concerning the form of the thesis and the format of the electronic copy. Submitting the Master's thesis via means of telecommunication is not permissible. In addition, students may be asked to transmit their Master's thesis to the website specified by the Office of Student and Examination Services in order to have it checked for plagiarism. The time of submission is to be put on record; if the thesis is submitted by mail, the decisive criterion is the point of time at which the thesis is submitted to the postal service. When submitting the thesis, the student is required to declare in writing that he/she has independently written the thesis – in case of a joint team project his/her part of the thesis, which has been marked accordingly – and has used no other than the sources and means indicated and stated in quotations. Possible penalties for attempted cheating as laid down in section 15 (3) are to be acknowledged.

- (2) The Master's thesis is to be evaluated by two examiners. One of the examiners is to be the thesis adviser. The other examiner is to be determined by the examination board. If section 25 (2) sentence 3 applies, he/she must be a professor. If the examiners' evaluations differ from each other and the divergence of both grades is less than 2.0, the grade for the Master's thesis is calculated by the arithmetic mean of both individual grades. If there is a divergence of 2.0 or greater, the examination board is to determine a third examiner. In this case, the grade for the Master's thesis is calculated by the arithmetic mean of the two better individual grades. However, the Master's thesis can only be graded "sufficient" or better if at least two of the grades are "sufficient" or better.

- (3) Students who pass the Master's thesis are awarded twenty-seven credits in accordance with section 12.

### **Section 29 Final oral examination (*Kolloquium*)**

- (1) The final oral examination complements the Master's thesis. It is to be evaluated as an independent examination and is to be held within four weeks after the submission of the Master's thesis. It is to determine whether the student is capable of orally presenting and independently justifying the findings of the Master's thesis, its scientific and methodological fundamentals as well as inter- and multidisciplinary contexts, and of assessing the thesis' significance for practice.
- (2) Students may only be admitted to the final oral examination if they
1. are enrolled or admitted as students or auditors in compliance with section 52 (2) of the North Rhine-Westphalia Higher Education Act and
  2. have received a grade of at least "sufficient" for their Master's thesis.
- (3) Students are required to file a written registration for the final oral examination with the examination board. They are also required to submit proof of having met the admission requirements stated in subsection 2, unless the examination board is already in possession of such proof. In accordance with section 26, students may register for the final oral examination when they apply for admission to the Master's thesis; in this case, students are admitted to the final oral examination as soon as all required proof and documents have been submitted to the Office of Student and Examination Services.
- (4) The final oral examination is normally to be held and evaluated by the examiners of the Master's thesis. If section 28 (2) applies, the final oral examination is to be held by those examiners whose individual evaluations were used to calculate the grade for the Master's thesis.
- (5) The final oral examination comprises an oral presentation with ensuing discussion of roughly 45 minutes duration in total. The provisions laid down for oral examinations (section 21) apply accordingly.
- (6) The final oral examination may be retaken once.
- (7) In accordance with section 12, students are awarded three credits for the final oral examination.

## **V. Results of the Master's examination**

### **Section 30 Results of the Master's examination**

- (1) The student has passed the Master's examination if he/she has obtained 90 credits. This requires students to have passed all module examinations required.
- (2) The student has failed the Master's examination if one of the examinations stated in subsection 1 has been irreversibly evaluated as "insufficient" or "not passed" or is irreversibly deemed "insufficient" or "not passed". Students are to be notified about having failed the Master's examination. This notification is to include information on legal remedies. After the student's removal from the register of students, the chairperson of the examination board will upon request issue a certified document listing the examinations and assessments taken by the student and their respective grades, as well as the examinations missing in order for the student to complete the Master's examination. This certification must include a statement that the student has irreversibly failed the Master's examination.

Upon request, the chairperson of the examination board will issue a document listing only the completed examinations and assessments and their respective grades.

### **Section 31 Examination certificate; final cumulative grade**

(1) Graduates are to receive a certificate on the passed Master's examination promptly, if possible within four weeks after the last examination. This examination certificate is to include the grades and credits for all module examinations, the topic of the Master's thesis, the final cumulative grade for the Master's examination and - for transferred grades or recognized assessments from other universities - the locations at which these assessments were completed.

(2) The final cumulative grade for the Master's examination is determined by the average of the grades for the graded module examinations, including the Master's thesis and the final oral examination, which have been weighted by the corresponding credits. Instead of awarding the final cumulative grade of "excellent", the award "graduated with distinction" is to be conferred if the Master's thesis and final oral examination have been evaluated with a grade of 1.0 and the weighted average of all other grades of the Master's examination is not worse than 1.3.

(3) Grades awarded for additional examinations in compliance with section 23 (3) as well as for examinations which were made a prerequisite during enrollment in compliance with section 3 (3) are not accounted for in the calculation of the final cumulative grade.

(4) The examination certificate is to be signed by the chairperson of the examination board and is to bear the date of the day on which the last examination was completed.

(5) Graduates are to be handed out their diploma along with the examination certificate, bearing the date stated on the latter. The diploma is to attest to the conferral of the Master's degree in compliance with section 2 (5).

(6) The diploma is to be signed by the dean of the Faculty of Information, Media and Electrical Engineering at Cologne University of Applied Sciences, the dean of the Department of Computer Science at Bonn-Rhein-Sieg University of Applied Sciences and the chairperson of the examination board and is to bear the seal of Cologne University of Applied Sciences.

(7) Alongside the examination certificate and diploma, graduates are to receive an English-language diploma supplement, which corresponds to the guidelines and agreements of the German Rectors' Conference.

## **VI. Final provisions**

### **Section 32 Inspection of examination papers**

After having taken a module examination or having completed the Master's thesis and the final oral examination, the student is, upon request, to be granted an inspection of the written examination concerned, of – if available – the examiners' records related to the written examination and of the examination records of an oral examination. The inspection of a Master's thesis that was graded at least "sufficient" is to be granted only after completion of the corresponding final oral examination. The inspection is to be requested with the chairperson of the examination board within one month after the grade for the module examination was published or within one month after the examination certificate or the certification on irreversibly failing the Master's examination were issued. The chairperson is to determine time and place of the inspection.

### **Section 33 Invalidity of examinations**

- (1) If a student cheated during an examination and the cheating was detected only after the certificate and the certification mentioned in section 30 (2) sentences 4 and 5 were issued, the examination board is entitled to retroactively correct the grades for those examinations during which the student cheated and to render the Master's examination failed or partially failed.
- (2) If the requirements for admission to an examination were not met but the student did not attempt to cheat and if this matter was detected only after the certificate or the certification mentioned in section 30 (2) sentences 4 and 5 were issued, this shortcoming is offset by the student's passing of the examination. If the student deliberately effected a wrongful admission, the examination board is to decide on the legal consequences with due regard to the Administrative Procedures Act (*Verwaltungsverfahrensgesetz*) of North Rhine-Westphalia.
- (3) The incorrect examination certificate, the diploma and the diploma supplement or the incorrect certification mentioned in section 30 (2) sentences 4 and 5 are to be collected and reissued if need be. A decision pursuant to subsection 1 is to be ruled out after ten years have passed since the examination certificate or certification mentioned in section 30 (2) sentences 4 and 5 were issued.

### **Section 34 Entry into force; transitional regulations**

- (1) The examination regulations for the Master's program in Communication Systems and Networks enter into force as of September 1, 2012 and are to be published in Cologne University of Applied Sciences' official communication (*Amtliche Mitteilungen*).
- (2) These examination regulations apply to all students who enroll in the Master's program in Communication Systems and Networks at Cologne University of Applied Sciences as of winter semester 2012/13. It will upon request also apply to students having commenced their studies in the Master's program in *Kommunikationssysteme und Netze* at Cologne University of Applied Sciences or Bonn-Rhein-Sieg University of Applied Sciences prior to the aforementioned semester.
- (3) The examination regulations for the Master's program in *Kommunikationssysteme und Netze* at Cologne University of Applied Sciences and Bonn-Rhein-Sieg University of Applied Sciences of September 27, 2007 will cease to be in force as of March 31, 2016. Students in the Master's program in *Kommunikationssysteme und Netze* at Cologne University of Applied Sciences who enrolled in the program before September 1, 2012 may complete this program on the basis of the examination regulations of September 27, 2007 until March 31, 2016. Thereafter they will be subject to the examination regulations at hand.
- (4) When changing to the examination regulations at hand, examinations completed under previous examination regulations are to be recognized. Likewise, examinations completed under the examination regulations at hand are to be recognized for students who are subject to previous examination regulations. The examination board is to establish detailed regulations regarding this matter.
- (5) Changing to the examination regulations at hand might be subject to the condition that additional credits be gained in accordance with section 3 (3) in order to obtain a total of 300 credits for completing the Master's program in combination with the first academic degree.
- (6) Courses that will cease to be a component of the program when these examination regulations enter into force are to be offered up until the point of time that is mandated for students enrolled under the previous examination regulations, complying with the standard program duration and the curriculum. Following termination of these courses, the corresponding examinations are to be offered three more times.

(7) The examination regulations are published on the basis of the resolution of the Faculty Council of the Faculty of Information, Media and Electrical Engineering at Cologne University of Applied Sciences of May 23, 2012 and after legal review by the President's Office of Cologne University of Applied Sciences on February 6, 2013.

Cologne, July 8, 2013

The President  
of Cologne University of Applied Sciences

(Prof. Dr.-Ing. Chr. Seeßelberg)

*This is a translation of the original German examination regulations for the Master's program in Communication Systems and Networks offered by Cologne University of Applied Sciences. For all legal purposes, solely the German version shall be considered binding.*

*Translated on February 6, 2013 by Jan Müller, (Translator, M.A.), Cologne University of Applied Sciences.*

*Amended (dates updated) on August 26, 2013 by Prof. Dr. Uwe Dettmar (program co-chair) and on March 1, 2017 by Michèle Lohr (Conference Interpreter, M.A.).*

*As of September 1, 2015 Cologne University of Applied Sciences has been renamed to Technische Hochschule Köln (University of Applied Sciences).*

## Annex:

### Annex 1: Curriculum and overview of module examinations

Legend for all tables below:

CP: credit points in accordance with the ECTS

graded: module concludes with graded examination

ULP: module includes non-graded course-accompanying exams (such as laboratory) as prerequisite for taking concluding exams (section 17 (1) sentence 5)

Curriculum (beginning of studies in summer semester)

Module ID	Title of module	ULP:	graded	CP
<b>1<sup>th</sup> semester</b>				
HIM	Höhere Ingenieurmathematik	no	yes	5
NGN	Next Generation Networks	yes	yes	5
DSP	Digital Signal Processing	yes	yes	5
FSA	Research Project (Part A)	no	yes	5
FV1	Module 1 of the corresponding profile catalog		yes	5
FV2	Module 2 of the corresponding profile catalog		yes	5
<b>2<sup>th</sup> semester</b>				
FV3	Module 3 of the corresponding profile catalog		yes	5
FV4	Module 4 of the corresponding profile catalog		yes	5
FSB	Research Project (Part B)	no	yes	5
PL	Project Management	no	no	5
WV1	Module to be selected from the program's profile catalog or from the required courses and electives catalogs of the Faculty of Information, Media and Electrical Engineering or of other technological faculties.		yes	5
WV2	Module to be selected from the program's profile catalog or from the required courses and electives catalogs of the Faculty of Information, Media and Electrical Engineering or of other technological faculties.		yes	5
<b>3<sup>th</sup> semester</b>				
MAA	Master's thesis	no	yes	27
KOLL	Final oral examination	no	yes	3

Curriculum (beginning of studies in winter semester)

Module ID	Title of module	ULP:	graded	CP
<b>1<sup>th</sup> semester</b>				
HIM	Höhere Ingenieurmathematik	no	yes	5
FV1	Module 1 of the corresponding profile catalog		yes	5
FV2	Module 2 of the corresponding profile catalog		yes	5
FSA	Research Project (Part A)	no	yes	5
PL	Project Management	no	no	5
WV1	Module to be selected from the program's profile catalog or from the required courses and electives catalogs of the Faculty of Information, Media and Electrical Engineering or of other technological faculties.		yes	5
<b>2<sup>th</sup> semester</b>				
NGN	Next Generation Networks	yes	yes	5
DSP	Digital Signal Processing	yes	yes	5
FSB	Research Project (Part B)	no	yes	5
FV3	Module 3 of the corresponding profile catalog		yes	5
FV4	Module 4 of the corresponding profile catalog		yes	5
WV2	Module to be selected from the program's profile catalog		yes	5

Module ID	Title of module	ULP:	graded	CP
	or from the required courses and electives catalogs of the Faculty of Information, Media and Electrical Engineering or of other technological faculties.			
<b>3<sup>th</sup> semester</b>				
MAA	Master's thesis	no	yes	27
KOLL	Final oral examination	no	yes	3

Specialization: Systems Profile

Module ID	Title of module	ULP:	graded	CP
ACC	Advanced Channel Coding	yes	yes	5
AVC	Audio-/Video Coding	yes	yes	5
DC	Digital Communications	yes	yes	5
RFSD	RF System Design	yes	yes	5
OSDN	Optische u. drahtlose Übertragungsnetze	yes	yes	5

Specialization: Networks Profile

Module ID	Title of module	ULP:	graded	CP
AMC	Advanced Multimedia Communications	yes	yes	5
ODÜN	Optische u. drahtlose Übertragungsnetze	yes	yes	5
PRON	Planung, Realisierung, Optimierung u. Inbetriebnahme von Netzen	yes	yes	5
RTE	Routing- und Traffic Engineering	yes	yes	5
SIN	Sicherheit in Netzen	yes	yes	5

Specialization: Security Profile

Module ID	Title of module	ULP:	graded	CP
ID	Identifikationsverfahren	yes	yes	5
KRY	Kryptographie	yes	yes	5
EBS	Embedded Security	yes	yes	5
SIN	Sicherheit in Netzen	yes	yes	5
ZK	Zuverlässigkeit von Kommunikationssystemen	yes	yes	5
MW	Malware	yes	yes	5

Specialization: Information Theory Profile

Module ID	Title of module	ULP:	graded	CP
ACC	Advanced Channel Coding	yes	yes	5
AVC	Audio-/Video Coding	yes	yes	5
DC	Digital Communications	yes	yes	5
IS	Informationssicherheit	yes	yes	5
KRY	Cryptography	yes	yes	5