



**Official Communication (*Amtliche Mitteilung*) No. 64/2021**

Examination regulations for the programs Digital Sciences Südstadt Campus at the Faculty of Information Science and Communication Studies at TH Köln and Digital Sciences Gummersbach Campus at the Faculty of Computer Science and Engineering Science at TH Köln leading to the academic degree Master of Science

of November 22, 2021

published on November 30, 2021

- English translation -

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

**Technology**  
**Arts Sciences**  
**TH Köln**

Information:

Please note that in accordance with § 12 (5) of the North Rhine-Westphalia Higher Education Act (Hochschulgesetz – HG NRW) a violation of the formal and procedural requirements of the university's rules and self-governing laws cannot be asserted after one year has elapsed since this announcement, unless

- 1) the rules and regulations were not properly announced,
- 2) the executive board had previously objected to the decision of the body adopting the rules and regulations,
- 3) a complaint regarding the violation of the formal or procedural requirement had previously been made and in this complaint, the legal regulation violated was mentioned and the violating circumstances were described, or
- 4) at the time of publication of the rules and regulations, the legal consequences of the preclusion of complaint were not indicated.

Examination regulations  
for the programs

Digital Sciences Südstadt Campus at the Faculty of Information  
Science and Communication Studies at TH Köln and

Digital Sciences Gummersbach Campus at the Faculty of  
Computer Science and Engineering Science at TH Köln

leading to the academic degree Master of Science

of November 22, 2021

By virtue of § 2 (4) and § 64 (1) of the North Rhine-Westphalia Higher Education Act (*Gesetz über die Hochschulen des Landes Nordrhein-Westfalen - HG*) of Tuesday, September 16, 2014 (GV., NRW. p. 547) in the version of July 12, 2019 (GV. NRW. p. 425), last amended by law on March 25, 2021 (GV. NRW. p. 331), Technische Hochschule Köln (University of Applied Sciences) has determined the following examination regulations by statute:

# Contents

<b>I</b>	<b>General information</b> .....	<b>5</b>
§ 1	Applicability of the examination regulations; module catalog and study plan .....	5
§ 2	Objectives of the program; purpose of examinations; academic degree.....	5
§ 3	Admission requirements.....	6
§ 4	Standard program duration (Regelstudienzeit).....	8
§ 5	Scope and structure of examinations; examination deadlines .....	9
§ 6	Examination board .....	9
§ 7	Rights and duties of the examination board .....	9
§ 8	Decisions by the examination board.....	10
§ 9	Examiners and co-examiners.....	10
§ 10	Recognition of coursework and examinations .....	10
§ 11	Evaluation of examinations .....	11
§ 12	Credits in accordance with the ECTS (European Credit Transfer System).....	12
§ 13	Evaluation of examinations according to the ECTS grading scheme.....	13
§ 14	Retaking examinations.....	13
§ 15	Absence; withdrawal from examinations; cheating .....	13
<b>II</b>	<b>Module examinations</b> .....	<b>14</b>
§ 16	Objectives, scope and type of module examinations .....	14
§ 17	Admission to module examinations .....	15
§ 18	Conducting module examinations .....	16
§ 19	Written examinations.....	17
§ 20	Written multiple-choice examinations .....	17
§ 21	Oral examinations .....	18
§ 22	Other types of examinations.....	18
<b>III</b>	<b>Progression of studies</b> .....	<b>19</b>
§ 23	Modules and completion of the program, additional modules .....	19
§ 24	Module examinations .....	20
<b>IV</b>	<b>Master's thesis and final oral examination</b> .....	<b>21</b>
§ 25	Master's thesis; purpose; topic; examiners .....	21
§ 26	Admission to the Master's thesis .....	22
§ 27	Assignment of the topic and completing the Master's thesis.....	22

§ 28 Submission and evaluation of the Master's thesis .....	23
§ 29 Final oral examination ( <i>Kolloquium</i> ).....	23
<b>V Results of the Master's examination .....</b>	<b>24</b>
§ 30 Results of the Master's examination .....	24
§ 31 Examination certificate; final grade; diploma supplement .....	24
<b>VI Final provisions .....</b>	<b>25</b>
§ 32 Inspection of examination papers .....	25
§ 33 Invalidity of examinations .....	25
§ 34 Entry into force; transitional regulations .....	25

# I General information

## § 1 Applicability of the examination regulations; module catalog and study plan

(1) These examination regulations are to administer full-time studies and examinations of the Master's programs Digital Sciences Gummersbach Campus and Digital Sciences Südstadt Campus at Technische Hochschule Köln. The program Digital Sciences Gummersbach Campus is offered with the following specializations:

- BIS: Business Information Systems
- ITM: IT Management
- SAR: Software Architecture

The program Digital Sciences Südstadt Campus is offered with the following specialization:

- DIS: Data and Information Science

Applicants opt for one specialization at the time of application. Their choice is binding. Students are enrolled in one specialization.

- (2) Based on these examination regulations, TH Köln establishes a study plan (see [annex 1](#)) and a module catalog. The module catalog outlines the course contents, intended learning outcomes and structure of the individual modules, taking developments in the fields of science and university teaching as well as profession-specific requirements into account. The study plan provides students with a guideline for adequately scheduling their studies.
- (3) A part-time option of the program is available. The faculties have created an alternative study plan for part-time students in accordance with sect. 62a (2) of the North Rhine-Westphalia Higher Education Act.

## § 2 Objectives of the program; purpose of examinations; academic degree

- (1) Students who pass the Master's examination are awarded a university degree qualifying them to exercise professional work in the field relevant to the program and entitling them apply for admission to doctoral studies in accordance with § 67 (4), sentence 1, No. 3 HG.
- (2) Taking general study objectives into account (§ 58 of the North Rhine-Westphalia Higher Education Act), the program leading to the Master's examination ([sect. 4](#)) is designed to convey research-oriented topics of the discipline on the basis of scientific findings.
- (3) The Master's programs build on the contents of the Bachelor's programs in computer science at the Faculty of Computer Science and Engineering Science (F10) and the Bachelor's program Data and Information Science at the Faculty of Information Science and Communication Studies (F03) offered by Technische Hochschule Köln. F10 is responsible for the specializations (cf. § 1 (1)) BIS, ITM and SAR, F03 is responsible for the specialization DIS. The two faculties cooperate in offering courses for both programs.
- (4) The Master's examination ([§ 5](#)) is to determine whether students have acquired further specialized knowledge required to exercise work in their profession independently () and are prepared to assume social responsibility in a globalized world (global citizenship). It is also to determine whether they are able to work and conduct research independently and on the basis of scientific findings and methods.

- (5) Students who have passed the examinations listed in § 5, have completed an academic degree program, qualifying them to exercise work in the designated profession. Based on the successful completion of all examinations, the academic degree “Master of Science” is awarded in accordance with the regulations stated hereinafter.

### § 3 Admission requirements

- (1) Admission to the Master's program requires the successful completion of suitable a university program with at least a Bachelor's degree and a final grade of at least "good" (2.5) in the German grading system or its equivalent. A previously completed Bachelor's program is considered suitable if it covers contents from the field of computer science or information science, as per subsection 2, worth at least 80 ECTS credits. The joint examination board decides on the suitability of a program (cf. § 6 (1)). Additionally, language proficiency as detailed in subsection 3 is required. Applicants must also demonstrate in an aptitude test that they have knowledge in the six fields of action detailed in the table in subsection 6. If this is not the case they may be admitted on the condition that they make up for missing prerequisites during the Master's program (cf. Subsection 7). In case admission is or will be restricted, applicants also need to participate in a selection process as detailed in subsection 4 to 6. At the end of the application process, a ranking will be determined for each program. The highest-ranked applicants will be offered admission until all available places are allocated.
- (2) To meet the suitability requirement regarding the Bachelor's program, the required 80 ECTS credits covering contents from the field of computer science or information science must be from one of the following fields:
1. Theoretical computer science, formal languages, abstract machines, digital science
  2. Programming, programming paradigms, algorithms, algorithmics, mobile computing, software technology, software engineering
  3. Web development, web technologies, web-based applications
  4. Human computer interaction, development of interactive systems
  5. Knowledge organization
  6. Digital society, computer science & society, media informatics & society, information ethics
  7. Information visualization, information exploitation
  8. Information in companies, information management, process management, knowledge management
  9. Data modeling
  10. Data analysis, information analysis, business intelligence, business analytics, decision support
  11. Data mining, artificial intelligence
  12. Information research, information retrieval, search engine technologies
  13. Data bases, information systems, ERP systems, application systems
  14. IT law, data privacy laws, legal aspects of computer science
  15. Media technology and production, audio-visual media, computer graphics and animation

Communication technology and networks



16. Operating systems, distributed systems, computer architectures
17. IT operations, identity management, service management, visualization, services architectures, IT security, IT architecture management
18. IT controlling

- (3) Additionally, English language proficiency (B2 level of the Common European Framework or Reference for Languages or equivalent) is required for all specializations. Appropriate proof is to be submitted at the time of enrollment. Applicants to the specialization ITM (IT Management) are additionally required to have German language proficiency in order to be granted admission (minimum requirement: *Deutsche Sprachprüfung für den Hochschulzugang* (German language proficiency test for admission to university; DSH)), level 2 or equivalent.
- (4) A selection process is conducted if the number of places for the program or one of the specializations is limited and there are more applications than places available.

For this purpose, the joint examination board establish an admissions commission consisting of four professors who each represent one specialization. Each member of the admissions commission has a deputy who must also be a professor who represents the respective specialization in case the regular member is unavailable.

- (5) The degree of aptitude is determined in a multi-stage admissions process.
- Stage 1: For each program, applications are ranked by the following two criteria which are both weighted equally: grade of the Bachelor's degree and suitability of the Bachelor's degree as described in subsection 6. The highest-ranked applicants for each program are invited for an interview.
  - Stage 2: Interviews with the applicants are conducted and evaluated. These interviews are to help assess the applicants' prospects to successfully complete the program. Video conference interviews are possible.

Applications are ranked by the following criteria: Grade of the Bachelor's degree 50%, degree of suitability of the Bachelor's program as described in subsection 6 25% and evaluation of the interview 25%.

- (6) The degree of suitability of the Bachelor's program is determined with regard to the specialization selected. It is determined based on the missing prerequisites required for admission in the following six fields of action:
1. Field of action »Acting Responsibly« (AR)
  2. Field of action »Architecting and Coding Software« (ACS)
  3. Field of action »Designing Innovations and Products« (DIP)
  4. Field of action »Empowering Business« (EB)
  5. Field of action »Generating and Accessing Knowledge« (GAK)
  6. Field of action »Managing and Running I « (MRI)

Initially, it is determined for each field of action for which prerequisites are defined, to what extent suitable examinations and/or coursework were completed in the Bachelor's program (measured in ECTS credits as per § 4 (1) sentence 4). If the values listed in the following table

for the field of study specified in the application are not reached, the missing ECTS credits are added up for all fields of action (sum of missing prerequisites) and the percentage of the total number of credits required for the degree program is calculated (degree of relevance).

<i>Specialization</i>	Acting Responsibly	Architecting and Coding Software	Designing Innovations and Products	Empowering Business	Generating and Accessing Knowledge	Managing and Running IT	
	<b>AR</b>	<b>ACS</b>	<b>DIP</b>	<b>EB</b>	<b>GAK</b>	<b>MRI</b>	<b>Total</b>
<b>BIS</b>	5	10		25	5	5	<b>50</b>
<b>DIS</b>	5	10		5	30		<b>50</b>
<b>ITM</b>	5	5		5	5	30	<b>50</b>
<b>SAR</b>	5	30		5	5	5	<b>50</b>

- (7) Applicants with a university degree that meets the requirements stated in subsection 1, sentence 1 but who have not accumulated the required number of ECTS credits for their chosen specialization, as listed in the table in subsection 6, may be offered conditional admission. As per subsection 4, the admissions commission decides in these cases if applicants are offered admission. The admissions commission may decide to offer applicants admission on the condition that they complete examinations and/or coursework worth up to 15 ECTS credits within six months of the day of enrollment. Type and scope of these examinations and/or coursework is determined by the admissions commissions.
- (8) In exceptional cases, students may be admitted to the Master's program prior to having met the admission requirements stated in subsection 1 if they can provide proof of meeting the requirements within six months of the day of enrollment.
- (9) Admission is to be denied if the applicant has (within the jurisdiction of the German constitution) irreversibly failed (i.e. failed with no option to repeat) or lost the right to take an examination in the chosen program and if this examination is mandatory according the examination regulations. This also applies to programs whose content has strong similarities to that of the program described in these examination regulations.

#### § 4 Standard program duration (*Regelstudienzeit*)

- (1) The standard program duration is three or four semesters. The duration depends on the duration of and the total number of credits of the previously completed Bachelor's program. Students who have completed a Bachelors program with 210 credits and a standard program duration of seven semesters enroll in a Master's program with 90 ECTS credits and a standard program duration of three semesters. Students who completed a Bachelor's program with 180 credits and a standard program duration of six semesters must enroll in the Master's program with 120 credits and a standard program duration of four semesters. Hence, in compliance with the European Credit Transfer System (ECTS), students enrolled in the Master's program accumulate a total of 90 credits (§ 12) in the three-semester program or a total of 120 credits (§ 12) in the four-semester program.
- (2) New first-year students can enroll in the summer and in the winter semester.

## § 5 Scope and structure of examinations; examination deadlines

- (1) The program is divided into individual modules. Refer to § 23 and the study plan (annex 1) for details on the program structure. A student's successful completion of the program is to be determined by the examinations taken throughout the program (module examinations) as well as the Master's thesis and final oral examination. Group examinations are permissible.
- (2) Module examinations are to be held immediately after the corresponding module has been concluded according to the study plan.
- (3) The progression of studies, examination procedures and study plan are to be designed in a way that makes it possible for students to take all required examinations within the standard program duration. In accordance with § 26, students adhering to the study plan are to have registered for the Master's thesis by the end of the penultimate semester.
- (4) Examination procedures are to make allowance for the legal provisions for maternity and parental leave periods as well as the leave for the care of spouses, registered partners, relatives in direct line of descent or brothers and sisters in-law if they are in need of care. Respective requests are to be submitted in due time before the examination. This also applies for students who can prove – by submitting a medical certificate or in a different manner – that they are in disadvantage due to a permanent physical disability or chronic disease.

## § 6 Examination board

- (1) The Faculty of Computer Science and Engineering Science (F10) and the Faculty of Information Science and Communication Studies establish a joint 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 shall be an independent body of both faculties.
- (2) The examination board is elected by the faculty councils of faculties 03 and 10 and is made up of nine persons:
  - a) chairperson and vice-chairperson selected from the pool of professors;
  - b) three additional members selected from the pool of professors;
  - c) two members selected from the pool of academic staff;
  - d) two members selected from the pool of students;
- (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.

## § 7 Rights and duties of the examination board

- (1) The examination board is responsible for the administration of examinations. It also ensures that the examination regulations are complied with and that examinations are conducted properly. In particular, it is to decide on objections brought forward against decisions that were made in exam-related matters.
- (2) Additionally, the examination board is to report to the faculty council on developments related to examinations and the duration of studies upon request. It gives advice on potential reforms of the examination regulations, the module catalog and the study plans. The examination board may transfer its regular duties (in particular decisions on requests for withdrawals or credit transfers) to the chairperson or another member from the pool of professors of the examination board. This does not apply to decisions on objections.

- (3) The members of the examination board and a representative of the Executive Board 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 same examination period.
- (4) Sessions of the examination board are not open to the public.

## § 8 Decisions by the examination board

- (1) The examination board has a quorum if, in addition to the chairperson or vice-chairperson, one 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 has the casting vote. Student members and research assistants do not contribute to decisions on matters related to education and academics, particularly when it comes to the recognition or other evaluation of examinations and coursework or the appointment of examiners or co-examiners. Moreover, student members of the examination board do not participate in the debate and decision-making on matters related to examination topics or their own examinations.
- (2) All 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 public service, they are to be sworn to secrecy by the chairperson of the examination board.
- (3) Negative decisions of the examination board or its chairperson are to be reported to the respective student without delay. If necessary, the student shall be given the opportunity to be heard beforehand.

## § 9 Examiners and co-examiners

- (1) The examination board appoints 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 (qualified co-examiner). Examiners are independent for examination purposes.
- (2) If an oral examination is offered by more than one examiner, students may suggest one of them as their examiner. (Supplementary oral exams, if available in this program, are exempt from this rule.) Students may also suggest an examiner to be their thesis advisor. If possible, a student's suggestion is to be considered.
- (3) The examination board ensures that examination duties are split as evenly as possible among the examiners. The chairperson of the examination board ensures that the students will be notified of the name of their examiners in advance. This shall happen at the same time as the registration for the examination, i.e. usually at least two weeks before the examination 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 system is deemed sufficient.

## § 10 Recognition of coursework and examinations

- (1) Examinations and coursework completed within the jurisdiction of the Convention on the Recognition of Qualifications Concerning Higher Education in the European Region of April 11, 1997 (BGBl.II 2007; p. 712 - Lisbon Recognition Convention) are to be officially recognized upon request if it can be proven that they do not considerably differ from the examinations and

coursework required. The decision is to be made within six weeks of the submission of all required documents. If the recognition of such examinations and coursework denied, the university is to issue a substantiated notification on this matter. If it has been proposed to reject the recognition request, the Executive Board may be asked to review the decision.

- (2) Examinations and coursework completed in degree programs outside the jurisdiction of the Lisbon Recognition Convention are to be recognized analogous to subsection 1 upon request.
- (3) Achievements that are not part of a degree program may be recognized as examinations or coursework upon request if they are equivalent to the examinations and coursework required. Such achievements may only account for up to half of the total number of coursework or examinations required for the successful completion of the program.
- (4) For examinations and assessments that have been recognized, students are awarded the number of ECTS credits stated in the study plan (annex 1). In case of a partial recognition, the number of credits awarded is to be adjusted accordingly. Non-graded examinations taken at other universities or in other programs are to be recognized in accordance with subsections 2 and 3. They are to be identified accordingly on the examination certificate and are not accounted for in the calculation of the final grade.
- (5) Examinations and coursework completed in the same degree program or the same module at Technische Hochschule Köln are transferred without separate request.
- (6) The examination board, or a person commissioned by the examination board, is to decide in all cases laid out in subsections 1 to 5. In cases of doubt, it is to consult the examiners responsible for the individual modules.

## § 11 Evaluation of examinations

- (1) Examinations are to be evaluated in a differentiated and comprehensible manner by means of grades. Individual components of the overall evaluation may remain non-graded. Non-graded modules are acceptable in exceptional cases. Upon request of the examination board, examiners are to explain the evaluation in writing. Grades for individual examinations are to be determined by the respective examiner.
- (2) Graded modules are listed in §§ 23, 24 and/or the study plan.
- (3) The following grades are to be used for the evaluation of examinations:
 

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

Grades 0.7, 4.3, 4.7 and 5.3 do not exist.

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

up to 1.5	Grade: "excellent"
above 1.5 to 2.5	Grade: "good"
above 2.5 to 3.5	Grade: "satisfactory"
above 3.5 to 4.0	Grade: "sufficient"
above 4.0	Grade: "insufficient"

For the calculation of grades, only the first decimal is factored in; all other decimals are dropped without rounding.

- (5) If several examiners participate in an examination, they are to jointly evaluate the examination, provided that no other provisions are made hereinafter. Should the evaluations differ from one another, the grade is determined by the arithmetic mean of the individual grades as set down in § 4.
- (6) An examination is passed if it is graded "sufficient" or better. If a module examination consists of several components (partial or individual examinations), the module is passed if all components are passed.
- (7) Examinations are to be evaluated and students notified of the results within six weeks of the examination. Posting the information on the corresponding bulletin board or on an electronic examination management system is sufficient. Students are to be notified of the results of their Master's thesis within eight weeks.

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

- (1) Credits are assigned to each module of the Master's program, which makes credit transfers in accordance with the European Credit Transfer System (ECTS) possible. Credits are a quantitative measure of the overall workload that averagely gifted students need to successfully complete a component of the program. This includes courses, preparation and follow-up work for a course, self-study as well as examinations and exam preparation.
- (2) The student workload required to complete the Bachelor's program as detailed in the study plan amounts to 60 credits per academic year. One credit equals a student workload of 25 to 30 hours, thus the workload for students enrolled in the full-time program is 750 to 900 hours per semester during the lecture period and the semester break. This equals 32 to 39 hours per week for 46 weeks a year.
- (3) Students only receive credits if they successfully completed a module. This means that students are awarded the total number of credits for every graded module examination, as defined in § 11 (2 and 6), they have passed with a grade of at least "sufficient" irrespective of the grade received for the examination. A total of 120/90 credits are required to successfully complete the Master's program.
- (4) An overview of the number of credits assigned to the individual modules and to the Master's thesis as well as final oral examination is provided in the study plan ([annex 1](#)). More detailed information can be found in the module catalog.
- (5) Complying with [§ 10](#), credits obtained in accordance with the ECTS at other institutions of higher education within and outside the jurisdiction of the German constitution are to be recognized with the number of credits assigned in the current program. In case of a partial recognition, the number of ECTS credits awarded is to be adjusted accordingly, cf. [§ 10](#) (4, sentence 2)

### § 13 Evaluation of examinations according to the ECTS grading scheme

In accordance with § 31 (1), the examination certificate issued to students at the time of graduation includes a grade distribution table that indicates the relative position of the student's final grade. This grade distribution table is based on the requirements of the ECTS and the recommendations by the Standing Conference of the Ministers of Education and Cultural Affairs (*Kultusministerkonferenz*) and the German Rector's Conference (*Hochschulrektorenkonferenz*).

### § 14 Retaking examinations

- (1) Students who do not pass the Master's thesis or the final oral examination may retake each examination once. Module examinations may be retaken twice. It is recommended to retake failed examinations within one year of the failed attempt.
- (2) An examination graded at least "sufficient" may not be retaken.
- (3) Students who did not pass a module examination that is made up of several individual components or a combination of different types of examination, only need to retake the component that they did not pass.

### § 15 Absence; withdrawal from examinations; cheating

- (1) An examination is deemed "insufficient" (5.0) if a student fails to show up for an examination and is not able to present a good reason for their absence. An examination is also deemed "insufficient" if a student withdraws from it without good reason after the examination has begun or if they do not submit the examination within the given time frame. Sentence 1 also applies accordingly if students fail to submit their Master's thesis by the submission deadline.
- (2) Students who miss or withdraw from an examination must immediately report in writing to the examination board and present an explanation and appropriate evidence. In case of sickness, students are required to submit a comprehensible medical certificate confirming their incapability of taking the examination. Students who withdraw from an examination after its start are required to notify the proctor who will record the withdrawal in the examination records. If the examination board accepts the student's explanation, the student will be notified that they may request to register for the respective examination again.
- (3) If a student attempts to manipulate the result of their examination by cheating or by using unauthorized resources, the examination concerned will be graded "insufficient" (5.0) or "not passed". Carrying unauthorized resources may already be considered cheating. Unauthorized resources are all documents, electronic resources, electronic devices or other resources that are not explicitly allowed to be used during the respective examination. Students are required to identify 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 (also refer to the *Richtlinien des Präsidiums der TH Köln zur Sicherung guter wissenschaftlicher Praxis und zum Umgang mit wissenschaftlichem Fehlverhalten* (Guideline by TH Köln's Executive Board on the assurance of good scientific practice and handling of academic misconduct) of January 8, 2016 in its current version). If any solution artifacts (e.g. program codes, technical drawings, technical or scientific models and simulations) developed by others are adopted into own technical solution documents without indicating the source, this is also considered plagiarism. 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.

- (4) Anyone who disrupts the proper course of an examination may be expelled from the examination by the examiner or proctor, usually after prior warning. In such a case, the examination concerned is to be graded “insufficient” (5.0) or “not passed”. The reason for the expulsion from the exam is to be put on record (minutes of the exam). In this case, the expelled student may request that the decision be reviewed by the examination board. This also applies to the decisions of an examiner or exam supervisor in cases described in subsection 3. In case of alleged cheating the chairperson of the examination board is entitled, without prejudice to the Administrative Procedures Act for North Rhine-Westphalia (*Verwaltungsverfahrensgesetz*, VwVfG NRW), to question the examinee to determine evidence on the matter. Examiners may be asked to participate in the questioning.
- (5) In case of repeated or otherwise serious cheating (e.g. major plagiarism, i.e. copying of longer text passages not marked as quotations, or the skillful concealment of plagiarism) the examination board may decide that the examination is deemed permanently failed and the examinee is to be removed from the student register.
- (6) In addition, acts of cheating may be considered an administrative offense and punished by a fine. Refer to § 63 (5) of the Higher Education Act (*Hochschulgesetz*) for details.

## II Module examinations

### § 16 Objectives, scope and type of module examinations

- (1) The Master's program is divided into individual modules, each of which concludes with an examination. A module may extend over one or two semesters. The contents of a module may be taught in one or more courses with different methods of teaching and study. Pursuant to §§ 19 to 22, a module examination may be subdivided into several individual examinations of the same or different type. Based on the intended learning outcomes defined in the module description, examinations are to determine if and to which extend students have achieved the intended learning outcomes of a module. Students may be required to be familiar with relevant contents of previous modules. The number of participants of a module is limited as detailed in annex 2 to ensure that courses can be conducted properly. Students with a specialization for which the respective module is a required module are given preference.
- (2) The language of instruction and examination is usually English. Individual modules may also be offered in German. Additional information is provided in §§ 23 and 24, the study plan (annex 1) and the module catalog.
- (3) The examination type depends on the requirements of the respective module. Admissible types of examination are written or electronic examinations (§§ 19 and 20) of 60 to 120 minutes duration, oral examinations (§ 21) of 10 to 30 minutes duration per examinee and other types of examination (§ 22) as well as combinations of the aforementioned types of examination.
- (4) A student's total workload for module examinations, which are made up of a combination of several types of examination, is not to exceed the typical workload that a single type of examination would generate.
- (5) In 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 determines the examination type and modalities for each module, usually at the beginning of each semester unless this has already been set down in the study plan or module catalog. If an examination within a module consists of several components or a combination of different types of



examination, the examination board shall also specify how the individual components are weighted. Pursuant to § 11 (5), the overall grade is the arithmetic mean of the individual evaluations, unless other weighting factors have been established.

- (6) The examination board determines the examination period for written and oral examinations in consultation with the examiners usually one month before the examination period. The examination period is uniform and binding for all students who intend to take the respective module examination. Posting the information on the corresponding bulletin board or on an electronic examination management system is deemed sufficient.
- (7) In case of other examination types, the examiner determines the examination schedule in the first quarter of the course and informs the examination board. The examiner is to announce the examination schedule within this period. Posting the information on the corresponding bulletin board or on an electronic examination management system or another system provided by the university is deemed sufficient. Section 18 (1), phrase 2 and 3 does not apply.

### § 17 Admission to module examinations

- (1) Participation in an examination requires prior admission to the examination. Students are to request their admission to examinations within the registration period determined by the examination board using the electronic registration/withdrawal system provided by the Office of Student and Examination Services. In exceptional cases, students may alternatively submit a written registration request to the Office of Student and Examination Services. Students are to verify that their registration was properly recorded by checking the electronic examination management system.
- (2) Only individuals who are enrolled at Technische Hochschule Köln as regular or cross-registered students in accordance with § 52 (1) and (2) of the North Rhine-Westphalia Higher Education Act can register for examinations.
- (3) Students may be required to have passed preliminary assessments, lab courses, partial exams or coursework throughout the semester or other module examinations in order to be admitted to a module examination; see § 24 and the study plan (annex 1) for details.
- (4) The selection of required electives (*Wahlpflichtmodule*) in which the student intends to take examinations and that is listed in the registration request becomes binding with the registration. Once a required elective has been selected it can only be changed in justified exceptional cases. The approval of the examination board is required. It is not considered a justified exceptional case if a required elective module was irreversibly failed (failed with no option to repeat). Changes are not possible in this case. Project modules (see annex 1) may be completed several times depending on the specialization (see § 24). For these modules, the title of the project is given on the graduation certificate. For all other matters, the regulations set down in subsection 6 apply.
- (5) For oral examinations, a statement whether the student objects to the presence of students of the same program as audience during the examination is to be submitted along with the registration request, or by a separate deadline set by the examination board.
- (6) Students may revoke their registration for a module examination using the electronic registration/deregistration system provided by the Office of Student and Examination Services or, in exceptional cases, in writing with the Office of Student and Examination Services up until one week prior to the set examination date. By doing so, students will not lose an examination attempt. If a student withdraws from their first attempt to pass an examination, the selection of a required elective as per subsection 4 is no longer binding.

## (7) Admission is denied if

- a) the requirements stated in subsections 1 to 4 are not met, or
- b) the student fails to submit all documents and does not submit missing documents by the date set by the examination board, or
- c) the student has irreversibly failed (i.e. failed with no option to repeat), within the jurisdiction of the German constitution,
  - a Master's or other final examination in the same program or
  - a comparable examination in a program whose content has strong similarities to that of the program described in these examination regulations.

In all other cases, admission is only to be denied if the examinee has, within the jurisdiction of the German constitution, lost the right to take examinations in the same program at a different institution, e.g. by missing a deadline for retaking examinations.

## § 18 Conducting module examinations

- (1) For the module examinations specified in §§ 19 to 21, one examination date per semester is usually scheduled. However, each examination is to be offered at least once a year. With the exception of examinations which take place throughout the semester, examinations are to be held within the examination periods set by the examination board and which are announced at the beginning of the semester or toward the end of the previous semester. Examinations are to be scheduled in such a way that no classes need to be canceled. Examination procedures are to be documented in detail. (This applies in particular to oral examinations including presentations.)
- (2) Students are to be notified of the individual examination dates and their admission to the examinations at least two weeks prior to the examination concerned. Posting the information on the corresponding bulletin board or on an electronic examination management system is deemed sufficient.
- (3) Upon request, students are to identify themselves with a government-issued photo ID and their student ID card (MultiCa).
- (4) If a student – by submitting a medical certificate or in a different manner - substantiates that they are not capable of completely or partly taking the examination, coursework or admission test in its intended form or time frame due to a permanent disability or chronic disease pursuant to § 3 of the German Act on Equal Opportunities for Persons with Disabilities (*Behindertengleichstellungsgesetz*), the chairperson of the examination board decides, after due consideration, if, how and to what extent reasonable adjustments are appropriate. Applications for reasonable adjustments are to be submitted in due time (usually along with the registration for the exam at the latest and at least two months before the exam or by a date set by the chairperson of the examination board) along with all required supporting documents. The decision on the application is to be made within an appropriate time frame (usually within one month of the date of submission of the application or at least one month prior to the examination/the assignment of the topic). Applications for reasonable adjustments are to be submitted in due time (usually along with the registration for the exam at the latest and at least two months before the exam or by a date set by the chairperson of the examination board) along with all required supporting documents. In exceptional cases, sentences 1 to 4 also apply to persons with temporary health impairments.
- (5) If a written or oral examination is the second retake of a module examination, module component or individually assessed component or an examination which concludes a program, it is to be evaluated by at least two examiners.

- (6) According to §§ 19 and 20, examination records are to be kept which shall include at least the names of the record keeper and exam supervisor and examinees, the start and end time of the exam as well as any unusual occurrences.

### § 19 Written examinations

- (1) In written examinations students are to prove that – within a limited time frame and with limited resources – they are capable of identifying topics and tasks stemming from areas covered by the module by means of common scientific methods of their subject area and solving them correctly.
- (2) A proctor is present during written examinations. The examiner decides whether students are allowed to 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 jointly determine how the individual components of the examination shall be weighted prior to the examination; each examiner evaluates 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 that part of a written examination that covers their subject field. In such a case, the examination is evaluated based on the previously determined weighting of the individual components. § 18 (5) remains unaffected.
- (4) Examinations which make use of electronic resources are permissible. They are treated like written examinations. An electronic written exam (“eKlausur”) is a computer-based exam which is conducted using an exam software. It is drawn up, conducted and evaluated supported by information and communication technology. Electronic written exams are subject to technical feasibility and may be conducted in modules suitable for this type of examination upon request of the examiners and with approval of the examination board. Prior to the examination, students are given ample opportunity to get to know the electronic examination system. Electronic written exams are to be conducted in the presence of a person competent in the relevant field who is to produce a written record of the examination (sect. 18 (6)). It is to be ensured that the electronic data is kept and can be assigned to the individual examinees for the duration of the retention periods.

### § 20 Written multiple-choice examinations

- (1) Written examinations may be completely or partly conducted as multiple-choice examinations. In multiple-choice examinations students are asked to answer written questions 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 of the examiners and with approval of the examination board.
- (2) The questions asked in examinations are to target 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 accepted as correct answers.
- (4) The evaluation of a written examination is to include the following information:
  - a) the number of questions asked and the number of questions answered correctly by the examinee,

- b) the minimum number of questions required to be answered correctly in order to pass the examination,
  - c) in case the examination was passed, the percentage by which the number of correctly answered questions exceeds the minimum requirements,
  - d) the grade obtained by the student.
- (5) When evaluating 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 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.
- (6) If only part of the examination is in multiple-choice format, subsections 1 to 5 only apply to this part of the examination. If sentence 1 does not apply to an independent part of the examination, the regulations described in subsection 4 letters b) to d) do not apply.

### § 21 Oral examinations

- (1) With the exception of the cases defined in § 18 (5), oral examinations are held in the presence of an examiner and a qualified co-examiner (§ 9 (1)) or in the presence of several examiners (panel examination) as group examinations or individual examinations. If an examination covers several subject fields, each student is examined by only one examiner in each subject field unless § 18 (5) applies. Prior to grading the examination, the examiner is to consult with the co-examiner or the other examiners.
- (2) A written record of the essential topics and the results of the examination, in particular facts that are essential to the grading of the examination, is to be kept. 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 examinee has objected to this provision when registering for the examination. However, no audience is allowed during the examiners' consultation or during the announcement of examination results.

### § 22 Other types of examinations

- (1) Besides written and oral examinations, other types of examination, as listed in annex 3, may be chosen for module examinations.
- (2) Other types of examination are usually evaluated by one examiner, unless § 18 (5) applies.
- (3) A term paper is to determine whether students are capable of independently completing a written technical assignment within a given time frame, using scientific and subject-related methods. The examiner determines the topic, type, length and other style requirements of the paper at the beginning of the semester.
- (4) An oral report is to determine whether the examinee 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 determines the duration of the oral report at the beginning of the semester. A written record of facts that are essential for the grading of the oral report is to be kept. The grade is to be announced to the student one week after the oral report at the latest.

- (5) A learning portfolio documents the students' development of skills and competencies by means of presentations, essays, excerpts from internship reports, table of contents of term papers, lecture notes, to do lists, research reports and other presentations of coursework and products of learning. The documents assembled in the portfolio are called artifacts. A learning portfolio can only be considered an examination subject if it is accompanied by a student's reflection (written, oral or video) on the significance of these artifacts for the learning objective which was previously announced by the examiner. As the semester proceeds and the learning portfolio is assembled, the examiner will provide feedback on the development and/or artifacts. For the examination, the learning portfolio is revised based on the examiner's feedback. It is usually submitted in a digital format.
- (6) Term papers, oral contributions and other types of examinations, also 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, identifiers such as passages, subject fields, page numbers (for term papers) or other objective identifiers allowing for a clear distinction are to be indicated. If the focus of the intended learning outcome of the joint team project is on working together as a team, an overall evaluation of the team project is possible.

### III Progression of studies

#### § 23 Modules and completion of the program, additional modules

- (1) In all compulsory modules (required modules and required electives), students are to take module examinations as described in §§ 19 – 22. The program's modules are listed in § 24; the corresponding types of examination can be found in the study plan or module catalog, unless individually determined by the examination board (§ 16 (5); sentence 1). Modules can be selected according to the study plan (see annex 1). Additional information is available in the module catalog.
- (2) If there are more students who want to take a certain module than there are places available (see annex 2) places will be allocated as follows (as per § 59 (2) of the Higher Education Act):
  - a) First, students enrolled in the programs "Digital Sciences", for whom the respective module is required module, will be admitted.
  - b) Then students enrolled in the programs Digital Sciences who have taken the respective module in the past but did not pass it are admitted.
  - c) Remaining places are allocated to the remaining students enrolled in the program Digital Sciences.
  - d) If places remain vacant after available places have been allocated as described above, these places may be taken by students enrolled in other programs at TH Köln.

In the event of a tie in the categories a), b) c) or d) the decision will be made based on the following criteria in descending order:

  - 1) The higher number of credits accumulated so far.
  - 2) The higher number of semesters enrolled in this program.
  - 3) The better average grade for the module examinations taken so far as of March 31 (for the summer semester) and September 30 (for the winter semester).
  - 4) In case of a tie, the decision is made by lot.
- (3) A student may take examinations in more modules than the ones needed to earn the required 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 grade. If a student selects more than the required number of modules from the catalog of required electives and concludes them by passing the respective module examination, these are also considered additional modules. In this case, those module examinations taken first are considered required examinations.

## § 24 Module examinations

During the program module examinations as per annex 1 must be taken and passed. Details on module examinations to be taken can be found in the current versions of the study plan (annex 1) as well as the module catalog. In general, the following applies depending on the specialization:

- (1) In the 3-semester program (90 ECTS credits) in the specialization BIS exactly one Guided Project to be selected from the list below is to be completed:
- Guided Project with Team Supervision, focused on Generating and Accessing Knowledge (GP-TS-GAK, 18 ECTS credits)
  - Guided Project with Team Supervision, focused on Designing Innovation and Products (GP-TS-DIP, 18 ECTS credits)
  - Guided Project with Team Supervision, focused on Architecting and Coding Software (GP-TS-ACS, 18 ECTS credits)
  - Guided Project with Team Supervision, focused on Empowering Business (GP-TS-EB, 18 ECTS credits)

Additional projects are not allowed.

In the 4-semester program (120 ECTS credits) in the specialization BIS students may choose to complete projects worth up to 12 ECTS credits to be selected from the range of projects detailed in annex 1, in addition to the project requirements detailed for the 3-semester program.

- (2) In the specialization ITM the following modules are mandatory:
- Innovation Management (6 ECTS credits)
  - IT Consulting (6 ECTS credits)
  - IT Strategy (6 ECTS credits)
  - Network Architectures, Design and Infrastructures (6 ECTS credits)
  - Security, privacy and trust (6 ECTS credits)
  - Virtualization and service architectures (Master) (6 ECTS credits)

Additionally, projects worth at least 6 up to 24 ECTS credits to be selected from the following list must be completed:

- Project (focused) in the specialization "Managing and Running IT", Type F (6 ECTS credits)
- Project (comprehensive) in the specialization "Managing and Running IT", Type U (9 ECTS credits)
- Project (complex) in the specialization "Managing and Running IT", Type X (12 ECTS credits)

In the 4-semester program (120 ECTS credits) in the specialization ITM students may choose to complete modules or projects worth up to 30 ECTS credits to be selected from the range of modules and projects detailed in annex 1, in addition to the requirements detailed for the 3-semester program.

- (3) In the 3-semester program (90 ECTS credits) in the specialization SAR exactly one Guided Project to be selected from the list below is to be completed:
- Guided Project with Team Supervision, focused on Generating and Accessing Knowledge (GP-TS-GAK, 18 ECTS credits)
  - Guided Project with Team Supervision, focused on Designing Innovation and Products (GP-TS-DIP, 18 ECTS credits)
  - Guided Project with Team Supervision, focused on Architecting and Coding Software (GP-TS-ACS, 18 ECTS credits)
  - Guided Project with Team Supervision, focused on Empowering Business (GP-TS-EB, 18 ECTS credits)

Additional projects are not allowed.

In the 4-semester program (120 ECTS credits) in the specialization SAR students may choose to complete projects worth up to 12 ECTS credits to be selected from the range of projects detailed in annex 1, in addition to the project requirements detailed for the 3-semester program.

- (4) In the specialization DIS students can choose from all modules detailed in annex 1.

## IV Master's thesis and final oral examination

### §25 Master's thesis; purpose; topic; examiners

- (1) The Master's thesis is 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 Bachelor's theses, students may 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 § 9 (1). This examiner may also be the 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 § 9 (1) if it has been determined that no professor of the faculty is able to serve as thesis adviser for the intended topic of the Master's thesis. If approved by the chairperson of the examination board, students may write their Master's thesis at an institution outside the university if this institution provides sufficient advice and assistance. Students are to be given the opportunity to suggest topics for their Master's thesis.
- (3) Upon request, the chairperson of the examination board is to ensure 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 a team project if students' individual contributions to be evaluated are clearly distinguishable and can be evaluated accordingly and if it complies with the requirements stated in subsection 1. In order to verify a student's contribution, his or her passages, page numbers or other objective criteria allowing for a clear distinction are to be identified.
- (5) The Master's thesis may be written in English if endorsed by the chairperson of the examination board and the main examiner.

## § 26 Admission to the Master's thesis

- (1) Students are admitted to the Master's thesis if they meet the admission requirements stated in § 17 (2 and 5) and have, pursuant to §12, obtained a total of 90 credits in the examinations required in accordance with § 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 following documents are to be submitted at the time of registration, unless already submitted in the past:
  - a) proof of having met the admission requirements stated in subsection 1
  - b) a statement on previous attempts to write a Master's thesis or another final examination and on attempts to pass the Master's examination
  - c) a statement on which examiner is willing and able to prepare the topic of the Master's thesis and to function as thesis advisor, and
  - d) if applicable: the suggested topic of the Master's thesis.
- (3) Students may revoke their registration for the Master's thesis in writing up until the day the decision on admission is announced. In this case the registration will not count as a failed attempt.
- (4) The chairperson of the examination board decides on the admission to the Master's thesis. In cases of doubt, the decision lies with the entire examination board. Admission is denied if
  - a) the student does not meet the requirements stated in subsection 1, or
  - b) the supporting documents are incomplete, or
  - c) within the jurisdiction of the German constitution, a final thesis written by the student has been evaluated as "insufficient" without option to repeat, or if the student has irreversibly failed one of the examinations stated in subsection 2 sentence 2 item b).

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, e.g. due to having failed to meet a deadline for retaking examinations.

## § 27 Assignment of the topic and completing 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 of the topic of the Master's thesis assigned by the thesis advisor. The time of assignment is to be put on record.
- (2) The time frame for writing the Master's thesis (time of assignment to the day of submission) is four months. The topic and assignment must be such that it is possible to complete the Master's thesis within the given time frame. In exceptional cases, the chairperson of the examination board may extend the submission deadline by up to two weeks if the student concerned submits a request prior to the deadline stating the reasons for extending the deadline. The thesis advisor is to be consulted on this request.
- (3) Students may return a topic only once and only within the first two weeks of the assigned time frame. They are not required to state a reason for their withdrawal. If a student undertakes a second attempt to write a Master's thesis in compliance with § 14 (1), the student may only return their topic if they did not do so during their first attempt.
- (4) (4) § 18 (4) applies accordingly.



## § 28 Submission and evaluation of the Master's thesis

- (1) Students are to submit one hardcover copy of their Master's thesis and one copy - which is also used for plagiarism checks - on an electronic data carrier, or in another digital format, in one of the common word processing formats to the chairperson of the examination board, or at a location determined by the chairperson of the examination board, by the submission deadline. Submitting the thesis by means of telecommunication (e.g. by fax) is not permissible. 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, students are required to declare in writing that they have written the thesis – in case of a team project their part of the thesis, which has been identified accordingly – without assistance and have used no other sources or resources than the ones indicated. In case of quotations, sources are to be identified.
- (2) The Master's thesis shall be evaluated by two examiners. One of the examiners is to be the thesis advisor. The other examiner is to be appointed by the examination board. If § 25 (2) sentences 2 and 3 apply, 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 the arithmetic mean of the two grades. If there is a divergence of 2.0 or more, the examination board appoints a third examiner. In this case, the grade for the Master's thesis is the arithmetic mean of the two better 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 25 credits in accordance with § 12.

## § 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 take place shortly after the submission of the Master's thesis. Its aim 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
  - a) have accumulated at least 90 (of 120) or 60 (of 90) ECTS credits in this program.
  - b) are enrolled at Technische Hochschule Köln as regular or cross-registered students in accordance with § 52 (2) of the North Rhine-Westphalia Higher Education Act and
  - c) 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 Office of Student and Examination Services. Students need to submit proof of having met the admission requirements stated in subsection 2, unless such proof has already been presented to the Office of Student and Examination Services. In accordance with § 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 evidence and documents have been submitted to the Office of Student and Examination Services.
- (4) The final oral examination is usually conducted and evaluated by the examiners of the Master's thesis. If § 28 (2) sentence 6 applies, the final oral examination is conducted by those examiners whose individual evaluations were used to calculate the grade for the Master's thesis.
- (5) The duration of the final oral examination is approximately 45 minutes. The provisions for oral examinations (§ 21) apply accordingly.
- (6) In accordance with § 12, students are awarded 5 credits for the final oral examination.

## V Results of the Master's examination

### § 30 Results of the Master's examination

- (1) The Master's examination is passed if 120 (for the four-semester program) or 90 (for the three-semester program) credits have been accumulated. This requires students to have passed all required module examinations and to have obtained a grade of at least "sufficient" for the Master's thesis and the final oral examination. Additionally, the specialization-specific minimum requirements regarding credits to be accumulated in the six fields of action as per annex 1 must have been met. The minimum requirements are detailed in the study plan (see annex 1).
- (2) Students have failed the Master's examination if one of the examinations stated in subsection 1 has been irreversibly evaluated as "insufficient" or is irreversibly deemed "insufficient". Students are to be notified (in writing) of having failed the Master's examination. This notification is to include information on legal remedies. After the student's removal from the student register, the chairperson of the examination board will, upon request, issue a certified document listing all examinations and coursework taken by the student and the respective grades, as well as the examinations missing in order for the student to pass the Master's examination. This document must include the information 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 coursework and the respective grades.

### § 31 Examination certificate; final grade; diploma supplement

- (1) Graduates are to receive a certificate on the passed Master's examination without delay, if possible within four weeks of the last evaluation. This examination certificate is to include the name of the specialization, the grades and credits for all module examinations, topic of the Master's thesis, grades and credits for the Master's thesis and final oral examination, the final grade for the Master's examination and in case of transfer credits, the name of the institution where the examination was taken.
- (2) The final grade for the Master's examination is the average of the grades for the module examinations, the Master's thesis and the final oral examination, which have been weighted either by the corresponding credits or in another manner (defined in § 24 or the study plan). If a student has selected more than the required number of modules from the catalog of required electives and has passed them with a grade of at least "sufficient", only the grades of the modules taken first will be considered for the calculation of the final grade.
- (3) In accordance with § 23 (2), grades for additional modules are not accounted for in the calculation of the final grade.
- (4) The examination certificate is signed by the chairperson of the examination board and bears the date of the day on which the last examination was taken.
- (5) Graduates are to receive their Master's certificate (*Masterurkunde*) along with the examination certificate. The Master's certificate bears the same date as the examination certificate. The Master's certificate certifies that the Master's degree has been awarded in compliance with § 2 (5).
- (6) The Master's certificate is signed by the dean of the respective faculty and by the chairperson of the examination board and bears the seal of Technische Hochschule Köln.
- (7) In addition to the Bachelor's certificate and the examination certificate, graduates receive a diploma supplement in English, which corresponds to the guidelines and agreements of the German Rectors' Conference.

## VI Final provisions

### § 32 Inspection of examination papers

After each attempt to pass a module examination or the Master's thesis and final oral examination, the student is to be given access (upon request) to the written or electronic examination concerned and – if available – the examiners' records related to the examination and the examination records of an oral examination. Access to a Master's thesis that was graded at least "sufficient" is to be granted only after corresponding final oral examination (if applicable) was taken. Requests to access to these documents are to be addressed to the chairperson of the examination board within one month of the announcement of the grade for the module examination or within one month of the delivery of the examination certificate or the certification on irreversibly failing the Master's examination. The chairperson determines time and place of the inspection.

### § 33 Invalidity of examinations

- (1) If a student cheated during an examination and the cheating is detected only after the examination certificate, the Master's certificate, diploma supplement or the document mentioned in § 30 (2) sentences 3 and 5 was issued, the examination board is entitled to subsequently amend the grades for those examinations during which the student cheated and to declare 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 examination certificate, Master's certificate, diploma supplement or the certification mentioned in § 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*) for North Rhine-Westphalia.
- (3) If necessary, the incorrect examination certificate, the Master's certificate and the diploma supplement or the incorrect document as per § 30 (2), sentences 3 and 5 are to be collected and reissued. A decision pursuant to subsections 1 and 2 is to be ruled out if five years or more have passed since the examination certificate or document as per § 30 (2) sentences 3 and 5 was issued.

### § 34 Entry into force; transitional regulations

- (1) These examination regulations will come into force on September 1, 2021 and will be published in Technische Hochschule Köln's official communication (*Amtliche Mitteilungen*).
- (2) These examination regulations apply to all students who enroll in or apply for admission on of the Master's programs Digital Sciences at Technische Hochschule Köln as of the winter semester 2021/22. The specializations BIS, ITM and SAR will be offered for the first time in the winter semester 2021/22. The specialization DIS will be offered for the first time in the summer semester 2022. Additionally, subsections 3 and 4 also apply to students enrolled in the program in Informatik/Computer Science at the Faculty of Computer Science and Engineering Science at Technische Hochschule Köln based on the examination regulations of November 15, 2013 (*Amtliche Mitteilung 35/2013*).
- (3) The examination regulations for the program in Informatik/Computer Science at the Faculty of Computer Science and Engineering Science at Technische Hochschule Köln of November 15,

2013 (Amtliche Mitteilung 35/2013) will expire on February 29, 2024. Details are published in the regulation on the discontinuation of the program of May 21, 2021 (Amtliche Mitteilung 42/2021).

- (4) The examination regulations are issued on the basis of the resolution of the faculty council of the Faculty of Computer Science and Engineering Science of Technische Hochschule Köln of November 3, 2021 and the resolution of the faculty council of the Faculty of Information Science and Communication Studies of Technische Hochschule Köln of October 12, 2021 for their respective areas of responsibility, after legal review of Technische Hochschule Köln's Executive Board on September 8, 2021.

Cologne, November 22, 2021

President of Technische Hochschule Köln  
(University of Applied Sciences)

Prof. Dr. Stefan Herzig



## Annex

### Annex 1: Study plan

a) including required modules and electives, divided by specialization

Abbr.	Module	ECTS credits	BIS	DIS	ITM	SAR
ABIA	Advanced Business Intelligence and Analytics	6	Elec.	Elec.	Elec.	Elec.
AML	Advanced Machine Learning	6	Elec.	Elec.	Elec.	Elec.
ANLP	Advanced Natural Language Processing	3	Elec.	Elec.	Elec.	Elec.
BPM	Business Process Management	6	Elec.	Elec.	Elec.	Elec.
CEX	Coding Excellence	6	Elec.	Elec.	Elec.	Elec.
AMI	Current Approaches to Marketing and Innovation	6	Elec.	Elec.	Elec.	Elec.
DDM	Data Driven Modeling	6	Elec.	Elec.	Elec.	Elec.
DSE	Data Science and Ethics	6	Elec.	Elec.	Elec.	Elec.
DVI	Data Visualization	3	Elec.	Elec.	Elec.	Elec.
DDD	Domain-Driven Design of Large Software Systems	6	Elec.	Elec.	Elec.	Elec.
EAM	Enterprise Architecture Management	6	Elec.	Elec.	Elec.	Elec.
INM	Innovation Management	6	Elec.	Elec.	<b>Requ.</b>	Elec.
IDE	Interaction Design	6	Elec.	Elec.	Elec.	Elec.
ITC	IT Consulting	6	Elec.	Elec.	<b>Requ.</b>	Elec.
ITSTR	IT Strategy	6	Elec.	Elec.	<b>Requ.</b>	Elec.
LCSS	Large and Cloud-based Software Systems	5	Elec.	Elec.	Elec.	Elec.
LPSM	Leadership Principles and Strategic Management	6	Elec.	Elec.	Elec.	Elec.
LOD	Linked-Open Data and Knowledge Graphs	6	Elec.	Elec.	Elec.	Elec.
MSG	Management Simulation Game	6	Elec.	Elec.	Elec.	Elec.
MUU	Management und Unternehmenssteuerung	6	Elec.	-	-	-
MODI	Mobile and Distributed Systems	6	Elec.	Elec.	Elec.	Elec.
MDS	Modern Database Systems	6	Elec.	Elec.	Elec.	Elec.
MVS	Multivariate Statistics	6	Elec.	Elec.	Elec.	Elec.
NLP	Natural Language Processing	3	Elec.	Elec.	Elec.	Elec.
NADI	Network Architectures, Design and Infrastructures	6	Elec.	Elec.	<b>Requ.</b>	Elec.
NGN	Next Generation Networks	5	Elec.	Elec.	Elec.	Elec.
OSC	Open Science	6	Elec.	Elec.	Elec.	Elec.
OR	Operations Research	6	Elec.	Elec.	Elec.	Elec.
PEM	Performance Management	6	Elec.	Elec.	Elec.	Elec.
PMI	Process Mining	6	Elec.	Elec.	Elec.	Elec.
PM	Project Management	6	Elec.	Elec.	Elec.	Elec.
PADT	Psychological aspects of digital transformation	6	Elec.	Elec.	Elec.	Elec.
QS	Quality Assurance	6	Elec.	Elec.	Elec.	Elec.
RSN	Research in (social) networks	3	Elec.	Elec.	Elec.	Elec.
RE	Requirements Engineering	6	Elec.	Elec.	Elec.	Elec.
SCC	Scientific Computing	6	Elec.	Elec.	Elec.	Elec.
SCSR	Seminar Computer Science Research	3	Elec.	Elec.	Elec.	Elec.
SKD	Seminar Knowledge Discovery	3	Elec.	Elec.	Elec.	Elec.
SPV	Security, privacy and trust	6	Elec.	Elec.	<b>Requ.</b>	Elec.
STE	Socio-technical design patterns	6	Elec.	Elec.	Elec.	Elec.
SGM	Specific fields of mathematics	6	Elec.	Elec.	Elec.	Elec.

Abbr.	Module	ECTS credits	BIS	DIS	ITM	SAR
SGMCI	Specific fields of human computer interaction	6	Elec.	Elec.	Elec.	Elec.
UBICOMP	Ubiquitous Computing	6	Elec.	Elec.	Elec.	Elec.
VDM	Virtualization and service architectures	6	Elec.	Elec.	<b>Requ.</b>	Elec.
WAM	Web Audience Measurement und Web Analytics	3	Elec.	Elec.	Elec.	Elec.
WIR	Web Information Retrieval	6	Elec.	Elec.	Elec.	Elec.
WEB	Web Technologies	6	Elec.	Elec.	Elec.	Elec.
WDB	Competitive strategies in digital business	6	Elec.	Elec.	Elec.	Elec.
<i>Projects</i>						
GP-ID	Guided Project (small), focused on Interdisciplinary Topics	6	Elec.	Elec.	Elec.	Elec.
GP-ACS	Guided Project focused on Architecting and Coding Software	12	Elec.	Elec.	Elec.	Elec.
GP-DIP	Guided Project focused on Designing Innovation and Products	12	Elec.	Elec.	Elec.	Elec.
GP-EB	Guided Project focused on Empowering Business	12	Elec.	Elec.	Elec.	Elec.
GP-GAK	Guided Project focused on Generating and Accessing Knowledge	12	Elec.	Elec.	Elec.	Elec.
GP-TS-ACS	Guided Project with Team Supervision, focused on Architecting and Coding Software	18	<b>Requ.</b> (choose one)	Elec.	Elec.	<b>Requ.</b> (choose one)
GP-TS-DIP	Guided Project with Team Supervision, focused on Designing Innovation and Products	18		Elec.	Elec.	
GP-TS-EB	Guided Project with Team Supervision, focused on Empowering Business	18		Elec.	Elec.	
GP-TS-GAK	Guided Project with Team Supervision, focused on Generating and Accessing Knowledge	18		Elec.	Elec.	
P-MRI-F	Project (focused) in the specialization "Managing and Running IT", type F	6	Elec.	Elec.	<b>Requ.</b> (6-24 ECTS credits)	Elec.
P-MRI-X	Project (complex) in the specialization "Managing and Running IT", type X	12	Elec.	Elec.		Elec.
P-MRI-U	Project (comprehensive) in the specialization "Managing and Running IT", type U	9	Elec.	Elec.		Elec.
<i>Thesis</i>						
MA	Master's thesis with final oral examination	30	<b>Requ.</b>	<b>Requ.</b>	<b>Requ.</b>	<b>Requ.</b>

Explanation: Requ.: Required module / Elec.: Elective/ - : not available for this specialization

### Study plan

- b) Divided by fields of action The following table provides details on the ECTS credits of the modules in the six fields of action. With regard to the modules offered in summer and winter semesters, students may choose when they take individual modules.

Abbr.	Module	DE	EN	AR	ACS	DIP	EB	GAK	MRI	ECTS total
ABIA	Advanced Business Intelligence and Analytics		x				2	4		6
AML	Advanced Machine Learning		x	1	2			3		6
ANLP	Advanced Natural Language Processing		x		1			2		3
BPM	Business Process Management		x		2		4			6
CEX	Coding Excellence		x		6					6
AMI	Current Approaches to Marketing and Innovation		x			2	4			6
DDM	Data Driven Modeling		x	1	2		1	2		6
DSE	Data Science and Ethics		x	2	1	1		2		6
DVI	Data Visualization		x					3		3
DDD	Domain-Driven Design of Large Software Systems		x		5		1			6
EAM	Enterprise Architecture Management		x				3		3	6
INM	Innovation Management		x	1		4	1			6
IDE	Interaction Design	x		1	1	4				6
ITC	IT Consulting	x				1	4	1		6
ITSTR	IT Strategy	x				2			4	6
LCSS	Large and Cloud-based Software Systems		x		4				1	5
LPSM	Leadership Principles and Strategic Management		x	3			3			6
LOD	Linked-Open Data and Knowledge Graphs		x	1		1		4		6
MSG	Management Simulation Game		x			2	4			6
MUU	-General and Corporate Management	x		1			5			6
MODI	Mobile and Distributed Systems		x		4	1			1	6
MDS	Modern Database Systems		x	1	2			3		6
MVS	Multivariate Statistics	x						6		6
NLP	Natural Language Processing		x	1				2		3
NADI	Network Architectures, Design and Infrastructures	x				1			5	6
NGN	Next Generation Networks		x	1	3				1	5
OSC	Open Science		x					6		6
OR	Operations Research		x			1	1	4		6
PEM	Performance Management	x		1			5			6
PMI	Process Mining		x	1			2	3		6
PM	Project Management	x		5	1					6
PADT	Psychological aspects of digital transformation		x	2		1	2		1	6
QS	Quality Assurance	x		1	4		1			6
RSN	Research in (social) networks	x						3		3
RE	Requirements Engineering		x		4		2			6
SCC	Scientific Computing		x		3			3		6
SCSR	Seminar Computer Science Research		x		1		1		1	3
SKD	Seminar Knowledge Discovery		x					3		3



Abbr.	Module	DE	EN	AR	ACS	DIP	EB	GAK	MRI	ECTS total	
SPV	Security, privacy and trust	x		1		1			4	6	
STE	Socio-technical design patterns	x		1	1	4				6	
SGM	Specific fields of mathematics	x						6		6	
SGMCI	Specific fields of human computer interaction	x		1	1	4				6	
UBICOMP	Ubiquitous Computing		x		1	4			1	6	
VDM	Virtualization and Service Architectures	x		1	1				4	6	
WAM	Web Audience Measurement and Web Analytics	x						3		3	
WIR	Web Information Retrieval		x		1			5		6	
WEB	Web Technologies	x		1	5					6	
WDB	Competitive strategies in digital business		x			3	3			6	
Projects											
GP-ID	Guided Project (small), focused on Interdisciplinary Topics	x	x	1	1	1	1	1	1	6	
GP-ACS	Guided Project focused on Architecting and Coding Software	x	x		4	2	2	2	2	12	
GP-DIP	Guided Project focused on Designing Innovation and Products	x	x		2	4	2	2	2	12	
GP-EB	Guided Project focused on Empowering Business	x	x		2	2	4	2	2	12	
GP-GAK	Guided Project focused on Generating and Accessing Knowledge	x	x		2	2	2	4	2	12	
GP-TS-ACS	Guided Project with Team Supervision, focused on Architecting and Coding Software	x	x	6	4	2	2	2	2	18	
GP-TS-DIP	Guided Project with Team Supervision, focused on Designing Innovation and Products	x	x	6	2	4	2	2	2	18	
GP-TS-EB	Guided Project with Team Supervision, focused on Empowering Business	x	x	6	2	2	4	2	2	18	
GP-TS-GAK	Guided Project with Team Supervision, focused on Generating and Accessing Knowledge	x	x	6	2	2	2	4	2	18	
P-MRI-F	Project (focused) in the specialization "Managing and Running IT", type F	x				2			4	6	
P-MRI-X	Project (complex) in the specialization "Managing and Running IT", type X	x		1	1	3	1		6	12	
P-MRI-U	Project (comprehensive) in the specialization "Managing and Running IT", type U	x		1		3			5	9	
Thesis											
MA	Master's thesis with final oral examination	x	x	<i>(not assigned)</i>							30

Explanation: DE: Language of instruction and examination German, EN: Language of instruction and examination English

AR Field of action »Acting Responsibly«, ACS: Field of action »Architecting and Coding Software«, DIP: Field of action »Designing Innovations and Products«, EB: Field of action »Empowering Business«, GAK: Field of action »Generating and Accessing Knowledge«, MRI: Field of action »Managing and Running IT «

Depending on the specialization, the following minimum requirements regarding fields of action must be met to successfully complete the program:

Specialization	Acting Responsibly	Architecting and Coding Software	Designing Innovations and Products	Empowering Business	Generating and Accessing Knowledge	Managing and Running IT	not assigned		Total
	AR	ACS	DIP	EB	GAK	MRI	3 sem.	4 sem.	
<b>BIS</b>	6	3	3	22	3	3	20	50	<b>60 / 90</b>
<b>DIS</b>	5	5			30		20	50	<b>60 / 90</b>
<b>ITM</b>	3	3	10	4		20	20	50	<b>60 / 90</b>
<b>SAR</b>	8	20	<i>At least 12 ECTS credits overall in 1 or 2 fields of action</i>				20	50	<b>60 / 90</b>

Explanation: All values are in ECTS credits. The total sum does not include the Master's thesis.

AR Field of action »Acting Responsibly«, ACS: Field of action »Architecting and Coding Software«, DIP: Field of action »Designing Innovations and Products«, EB: Field of action »Empowering Business«, GAK: Field of action »Generating and Accessing Knowledge«, MRI: Field of action »Managing and Running IT «

### Sample study plan specialization DIS

Abbr.	Module	DE	EN	AR	ACS	DIP	EB	GAK	MRI	Total ECTS
AML	Advanced Machine Learning		x	1	1			4		6
ANLP	Advanced Natural Language Processing		X					3		3
DSE	Data Science and Ethics		X	2	1	1		2		6
DVI	Data Visualization		X					3		3
LOD	Linked-Open Data and Knowledge Graphs		X	1		1		4		6
PMI	Process Mining		X	1			2	3		6
SKD	Seminar Knowledge Discovery		X					3		6
WAM	Web Audience Measurement and Web-Analytics	X						3		3
WIR	Web Information Retrieval		X					6		6
WEB	Web Technologies	X		1	5					6
GP-GAK	Guided Project focused on Generating and Accessing Knowledge	x	x		2	2	2	4	2	12
MA	Master's thesis with final oral examination	X	X							30
	Total number of ECTS credits accumulated			6	9	4	4	35	2	90
	ECTS credits required for the specialization DIS			5	5			30		

### Sample study plan including modules offered

(divided by specialization and fields of action, including number of examinations)

## Annex 2: Participant limits and allocation of places

Abbr.	Module	Faculty	SoSe	WiSe	Participants	
					Min.	Max.
ABIA	Advanced Business Intelligence and Analytics	F10		x	5	25
AML	Advanced Machine Learning	F03		x	5	20
ANLP	Advanced Natural Language Processing	F03		x	5	20
BPM	Business Process Management	F10	x		5	25
CEX	Coding Excellence	F10		(opt.)	4	20
AMI	Current Approaches to Marketing and Innovation	F10	x		5	15
DDM	Data Driven Modeling	F10		x	5	35
DSE	Data Science and Ethics	F10	x		5	35
DVI	Data Visualization	F03	x		6	20
DDD	Domain-Driven Design of Large Software Systems	F10		x	5	20
EAM	Enterprise Architecture Management	F10	x		5	25
INM	Innovation Management	F10		x	6	30
IDE	Interaction Design	F10		x		30
ITC	IT Consulting	F10	x		5	25
ITSTR	IT Strategy	F10	x		6	30
LCSS	Large and Cloud-based Software Systems	F07	x		5	10
LPSM	Leadership Principles and Strategic Management	F10	x		6	25
LOD	Linked-Open Data and Knowledge Graphs	F03		x	6	20
MSG	Management Simulation Game	F10		x	8	20
MUU	General and Corporate Management	F10		x	6	15
MODI	Mobile and Distributed Systems	F10	x		5	20
MDS	Modern Database Systems	F10	x		3	20
MVS	Multivariate Statistics	F03	x		5	20
NLP	Natural Language Processing	F03	x		1	20
NADI	Network Architectures, Design and Infrastructures	F10		x	6	35
NGN	Next Generation Networks	F07	x			3
OSC	Open Science	F03/F10		x	5	20
OR	Operations Research	F10		x	5	25
PEM	Performance Management	F10	x		8	25
PMI	Process Mining	F03		x	5	20
PM	Project Management	F10	x		6	30
PADT	Psychological aspects of digital transformation	F10		x	5	20
QS	Quality Assurance	F10	x		5	25
RSN	Research in (social) networks	F03		x	5	20
RE	Requirements Engineering	F10	x		4	20
SCC	Scientific Computing	F10	x	x	2	10
SCSR	Seminar Computer Science Research	F10	(opt.)	(opt.)	5	20
SKD	Seminar Knowledge Discovery	F03	x	x	5	20
SPV	Security, privacy and trust	F10		x	6	40
STE	Socio-technical design patterns	F10		x	3	40

Abbr.	Module	Faculty	SoSe	WiSe	Participants	
					Min.	Max.
SGM	Specific fields of mathematics	F10		x	5	35
SGMCI	Specific fields of human computer interaction	F10	x		4	20
UBICOMP	Ubiquitous Computing	F10		x	5	20
VDM	Virtualization and Service Architectures	F10	x		5	20
WAM	Web Audience Measurement and Web Analytics	F03		x	5	20
WIR	Web Information Retrieval	F03		x	5	20
WEB	Web Technologies	F10	x		5	20
WDB	Competitive strategies in digital business	F03		x	6	15
<b>Projects</b>						
GP-ID	Guided Project (small), focused on Interdisciplinary Topics	F10	x	x	2	20
GP-ACS	Guided Project focused on Architecting and Coding Software	F10	x	x	2	20
GP-DIP	Guided Project focused on Designing Innovation and Products	F10	x	x	2	20
GP-EB	Guided Project focused on Empowering Business	F10	x	x	2	20
GP-GAK	Guided Project focused on Generating and Accessing Knowledge	F10	x	x	2	20
GP-TS-ACS	Guided Project with Team Supervision, focused on Architecting and Coding Software	F10	x	x	2	20
GP-TS-DIP	Guided Project with Team Supervision, focused on Designing Innovation and Products	F10	x	x	2	20
GP-TS-EB	Guided Project with Team Supervision, focused on Empowering Business	F10	x	x	2	20
GP-TS-GAK	Guided Project with Team Supervision, focused on Generating and Accessing Knowledge	F10	x	x	2	20
P-MRI-F	Project (focused) in the specialization "Managing and Running IT", type F	F10	x	x	1	5
P-MRI-X	Project (complex) in the specialization "Managing and Running IT", type X	F10	x	x	3	10
P-MRI-U	Project (comprehensive) in the specialization "Managing and Running IT", type U	F10	x	x	2	7
<b>Thesis</b>						
MA	Master's thesis with final oral examination	F03/F10	x	x	1	1

Explanation: *Faculty*: Module offered by faculty

SoSe/WiSe: X = module is offered in the summer or winter semester / (opt) = module is optionally offered in the summer or winter semester (if teaching capacities allow), empty = module is not offered in the summer or winter semester

Participants min: minimum number of participants required for the module to be offered

Participants max: maximum number of participants (participant limit) for the module

### Annex 3: Exam types

Abbreviation	Module	Exam type	No.
ABIA	Advanced Business Intelligence and Analytics	Project over the course of a semester, incl. preparation of a portfolio and expert discussion	1
AML	Advanced Machine Learning	Project over the course of a semester, incl. expert discussion	1
ANLP	Advanced Natural Language Processing	Academic paper incl. presentation	1
BPM	Business Process Management	Project over the course of a semester, incl. presentation and expert discussion	1
CEX	Coding Excellence	Project over the course of a semester, incl. presentation and expert discussion	1
AMI	Current Approaches to Marketing and Innovation	Project over the course of a semester, incl. presentation	1
DDM	Data Driven Modeling	Written exam and project over the course of a semester/presentation	2
DSE	Data Science and Ethics	Project over the course of a semester, incl. preparation of a portfolio and expert discussion	1
DVI	Data Visualization	Written exam and papers during the semester	2
DDD	Domain-Driven Design of Large Software Systems	Project over the course of a semester, incl. presentation	1
EAM	Enterprise Architecture Management	Project over the course of a semester	1
INM	Innovation Management	Project over the course of a semester	1
IDE	Interaction Design	Expert discussion	1
ITC	IT Consulting	Presentation incl. reflection report	1
ITSTR	IT Strategy	Expert discussion / presentation on the the topic or artifact	1
LCSS	Large and Cloud-based Software Systems	Written exam and papers during the semester	2
LPSM	Leadership Principles and Strategic Management	Written exam and project over the course of a semester/presentation	2
LOD	Linked-Open Data and Knowledge Graphs	Written exam and papers during the semester	2
MSG	Management Simulation Game	Project over the course of a semester, incl. presentation and expert discussion	1
MUU	General and Corporate Management	Expert discussion	1
MODI	Mobile and Distributed Systems	Project over the course of a semester incl. portfolio and presentation	1
MDS	Modern Database Systems	Academic paper incl. presentation	1
MVS	Multivariate Statistics	Expert discussion or written exam	1
NLP	Natural Language Processing	Expert discussion or written exam	1
NADI	Network Architectures, Design and Infrastructures	Expert discussion or written exam	1
NGN	Next Generation Networks	Project over the course of a semester, incl. expert discussion	1
OSC	Open Science	Project over the course of a semester, incl. presentation	1
OR	Operations Research	Project over the course of a semester or expert discussion	1

Abbreviation	Module	Exam type	No.
PEM	Performance Management	Written exam and poster session (prepared over the course of one semester)	2
PMI	Process Mining	Project over the course of a semester, incl. presentation	1
PM	Project Management	Expert discussion	1
PADT	Psychological aspects of digital transformation	Project over the course of a semester, incl. presentation	1
QS	Quality Assurance	Preparation of a portfolio over the course of a semester incl. a written performance review and reflection	1
RSN	Research in (social) networks	Academic paper on a case study (over the course of one semester)	1
RE	Requirements Engineering	Project over the course of a semester, incl. expert discussion	1
SCC	Scientific Computing	Project over the course of a semester, incl. presentation	1
SCSR	Seminar Computer Science Research	Academic paper incl. presentation	1
SKD	Seminar Knowledge Discovery	Academic paper incl. presentation	1
SPV	Security, privacy and trust	Expert discussion on an academic paper (written over the course of the semester) incl. presentation	1
STE	Socio-technical design patterns	Academic paper	1
SGM	Specific fields of mathematics	Written exam and academic paper written over the course of a semester/presentation	2
SGMCI	Specific fields of human computer interaction	Expert discussion on an academic paper (written over the course of the semester) incl. presentation	1
UBICOMP	Ubiquitous Computing	Project over the course of a semester with academic paper/presentation as documentation	1
VDM	Virtualization and Service Architectures	Project over the course of a semester	1
WAM	Web Audience Measurement and Web Analytics	Academic paper on a case study (over the course of one semester)	1
WIR	Web Information Retrieval	Written exam and papers during the semester	2
WEB	Web Technologies	Project over the course of a semester, incl. expert discussion	1
WDB	Competitive strategies in digital business	Project over the course of a semester, incl. presentation	1
<b>Projects</b>			
GP-ID	Guided Project (small), focused on Interdisciplinary Topics	Project over the course of a semester, incl. presentation	1
GP-ACS	Guided Project focused on Architecting and Coding Software	Project over the course of a semester, incl. presentation	1
GP-DIP	Guided Project focused on Designing Innovation and Products	Project over the course of a semester, incl. presentation	1
GP-EB	Guided Project focused on Empowering Business	Project over the course of a semester, incl. presentation	1
GP-GAK	Guided Project focused on Generating and Accessing Knowledge	Project over the course of a semester, incl. presentation	1
GP-TS-ACS	Guided Project with Team Supervision, focused on Architecting and Coding Software	Written exam and project over the course of a semester/presentation	2

Abbreviation	Module	Exam type	No.
GP-TS-DIP	Guided Project with Team Supervision, focused on Designing Innovation and Products	Written exam and project over the course of a semester/presentation	2
GP-TS-EB	Guided Project with Team Supervision, focused on Empowering Business	Written exam and project over the course of a semester/presentation	2
GP-TS-GAK	Guided Project with Team Supervision, focused on Generating and Accessing Knowledge	Written exam and project over the course of a semester/presentation	2
P-MRI-F	Project (focused) in the specialization "Managing and Running IT", type F	Project over the course of a semester, incl. presentation	1
P-MRI-X	Project (complex) in the specialization "Managing and Running IT", type X	Project over the course of a semester, incl. presentation	1
P-MRI-U	Project (comprehensive) in the specialization "Managing and Running IT", type U	Project over the course of a semester, incl. presentation	1
Thesis			
MA	Master's thesis with final oral examination		

Explanation:

*Exam type:* Exam type for the respective module

*No.:* Number of partial exams