

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.

**Examination regulations**  
  
**for the Master's program in Informatik / Computer Science**  
**conferring the degree**  
**Master of Science**  
**of the Faculty of Computer Science and Engineering Science**  
**at Cologne University of Applied Sciences**

**of**  
**November 15, 2013**

By virtue of section 2 (4) and section 64 (1) of the North Rhine-Westphalia Higher Education Act (Gesetz über die Hochschulen im Lande Nordrhein-Westfalen - HG) of October 31, 2006 (North Rhine-Westphalia Law and Ordinance Gazette (GV. NRW), p. 474)), last altered by the law of May 28, 2013 ([North Rhine-Westphalia Law and Ordinance Gazette (GV. NRW) 2013, p. 272]), Cologne University of Applied Sciences has determined the following examination regulations by statute:

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## **I. General information**

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

(1) These examination regulations are to administer the studies and examinations in the Master's program in Informatik/Computer Science at Cologne University of Applied Sciences. The program is divided into two specializations: Software Engineering and Information Systems

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

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

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

(2) Taking into account general study objectives (section 58 of the North Rhine-Westphalia Higher Education Act), the program leading to the Master's examination (section 4) is to enable students to use subject-specific methods and conduct scientific work. In addition to teaching expert knowledge, the program particularly focuses on developing students' theoretic and analytical skills, independent decision-making skills as well as their ability to participate in specialist discourse. Furthermore, the program is to promote personal skills such as independence, creativity and open-mindedness and prepare them for the Master's examination.

(3) The specialization "Software Engineering" focuses on user and architecture centered software engineering, i.e. software design processes which take human thinking and behavior into account. The program content in the field of system design is taught in an interdisciplinary manner and takes the respective social, technological and economic factors into account. The aim of the program is to qualify individuals to work as software architects who can rely on a broad scientific foundation. Course contents are taught in seminars as well as through accompanying practice-oriented case studies and projects. This is done in close cooperation with the affiliated research center for software quality (*Forschungsschwerpunkt Software-Qualität*) as well as partner companies.

(4) Students enrolled in the specialization in Information Systems are being prepared to fill leading positions in the software industry which require complex expert knowledge in the field of information management as well as in the field of design and operation of supporting information and communication technology. Using case studies as a core element of the curriculum students learn skills and methods to analyze business processes, recognize the potential of new business models and develop appropriate information infrastructures. Information technology is considered not only as a supporting element but as a driving force within a company. The program content focuses on two main topics: on the development and use of Information Technology to support management processes within a company on the one hand and on methods to create an IT landscape that takes inter-departmental processes into

account and takes a holistic approach to enterprise architecture on the other. In this regard, company-specific business process architectures and IT master plans that are based on security concepts, compliance, cost-benefit analysis and strategic concepts are to be coordinated and monitored. Students who opted for this specialization of the the program learn to assess new information technology with regard to the company's performance. They use the newly learned methods when working on projects and the Master's thesis, which is written in close cooperation with one of our business partners.

- (5) The language of instruction of a part of the courses is English. A list of the modules taught in English is available in the graphic representation of the curriculum and the module descriptions.
- (6) The specialization in Software Engineering builds on the skills and knowledge acquired in the Bachelor's program in Computer Science at Cologne University of Applied Sciences. The specialization in Information Systems builds on the skills and knowledge acquired in the Bachelor's program in Business Information Systems at Cologne University of Applied Sciences.
- (7) The Master's examination (section 5) is to determine whether the examinee has attained sound specialized knowledge required to exercise work in his/her profession independently and whether he/she is capable of independently exercising work and conducting research on the basis of scientific findings and methods.
- (8) By passing the examinations listed in section 5, students will have completed a scientific degree program, allowing them to exercise work in the designated profession. Based on the successful completion of all examinations, Cologne University of Applied Sciences is to confer the academic degree Master of Science in accordance with the regulations stated hereinafter.

### **Section 3 Admission requirements; placement test**

- (1) Students are to enroll in one of the specializations offered for the program.

Admission to the Master's program with a specialization in Software Engineering requires an undergraduate degree ("Bachelor of Science" or higher) in computer science or another suitable field with a final grade of at least "good" (2.5) in the German grading system or its equivalent. For the specialization in Software Engineering a program is considered suitable if the contents from the field of computer science are comparable to those of the Bachelor's program in Computer Science offered by Cologne University of Applied Sciences. The Examination Board is to decide on the suitability of a program.

Admission to the Master's program with a specialization in Information Systems requires an undergraduate degree ("Bachelor of Science" or higher) in business information systems/business informatics or another another suitable field with a final grade of at least "good" (2.5) in the German grading system or its equivalent. For the specialization in Information Systems a program is considered suitable if the contents from the fields of computer science, business administration and business informatics are comparable to those of the Bachelor's program in Business Information Systems offered by Cologne University of Applied Sciences. The Examination Board is to decide on the suitability of the undergraduate degree.

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

(3) In exceptional cases, students may enroll in the Master's program prior to having met the admission requirements stated in subsection 1 if they can present proof of meeting the admission requirements within one year of enrollment.

(4) An additional admission requirement of the specialization in Software Engineering is the successful completion of the German Language Proficiency Test for Admission of International Students (DSH - level 2) unless the student has acquired his/her higher education entrance qualification or undergraduate degree at an institution where the language of instruction is German.

(5) To be offered admission to the specialization in Information Systems applicants are required to present proof of their English language proficiency by presenting one of the following test results: TOEFL with a score of at least 550 points (paper-based test) or 213 points (computer-based test) or 80 points (internet-based test); IELTS with a score of 6.5 points; GMAT with a score of 400 or better or an equivalent test result. The examination board may recognize other test results as equivalent.

(6) Admission is to be denied if the applicant has irreversibly failed the Master's, Diplom or other final examination in a program in computer science or business information systems/business informatics within the jurisdiction of the German constitution or if he/she has lost the right to take examinations in this degree program. Admission is also to be denied if the applicant has - within the jurisdiction of the German constitution - irreversibly failed a comparable examination in another program in computer science which is equivalent to a mandatory examination in this Master's program, or if he/she has lost the right to take said examination.

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

(1) The standard duration of the Master's program is four semesters. In compliance with the European Credit Transfer System (ECTS), students are awarded a total of 120 credits (section 12) for the entire program. The standard duration of the program includes the examination period.

(2) The program is divided into individual modules. Detailed information can be found in section 23 and the curriculum (annex).

(3) In accordance with Section 59 of the North Rhine-Westphalia Higher Education Act, students have the right to attend courses from other programs.

(4) Students are enrolled in the program's first semester each winter or summer semester.

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

- (1) A student's successful completion of the program is to be determined by the examinations taken throughout the program (module examinations) and a final examination (Master's thesis and final oral examination). Group examinations are admissible.
- (2) Module examinations are to be held when the corresponding module has been concluded according to the curriculum. The program schedule is to guarantee that it is possible for students to have taken all module examinations by the end of the fourth semester.
- (3) In accordance with section 26, students are to register for the final part of the Master's examination (Master's thesis registration request) prior to the end of the penultimate semester of the program.
- (4) The examinations are to make allowance for the legal provisions for maternity and parental leave periods as well as the leave for the nursing and care of spouses, registered partners, relatives in direct line of descent or brothers and sisters in-law if they are in need of nursing or care.

## **Section 6 Examination board**

- (1) The faculty is/the faculties are to establish an examination board to be in charge of the organization of examinations and the arrangement of the duties entrusted to it by these examination regulations. The examination board is to be an independent body of the faculty.
- (2) The examination board is elected by the faculty council and is made up of seven persons:
  1. chairperson and vice chairperson, selected from the pool of professors;
  2. two additional members selected from the pool of professors;
  3. one member selected from the pool of research assistants or lecturers;
  4. 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 whose employment at Cologne University of Applied Sciences is their main occupation and their deputies have tenure of two years; the student members and their deputies have tenure of one year. Re-election is permissible.

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

- (1) The examination board is responsible for the organization of examinations. It is also to ensure that the examination regulations are complied with and that examinations are conducted properly. In particular, it is to rule on objections brought forward against decisions that were made in exam-related matters.
- (2) Upon request, the board is also to report to the faculty council on developments related to examinations and the duration of studies. It is to give advice on potential reforms of the examination regulations, module catalog and curricula. The examination board may transfer its regular duties to the chairperson of the examination board; this does not apply to decisions on objections.

(3) The members of the examination board and a representative of the President's Office have the right to be present during examinations. Exempt from this right are student members of the examination board who are to take the examination concerned during the very same examination period.

(4) Sessions of the examination board are not open to the public.

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

(1) The examination board has a quorum if, in addition to the chairperson or vice-chairperson, a member from the pool of professors and at least two additional members eligible to vote are present. Decisions require a simple majority. In case of a tie, the chairperson has the casting vote. Student members and research assistants do not have a say in decisions on matters related to education and academics, particularly when it comes to the recognition or other evaluation of examinations and assessments or the appointment of examiners or observers. Moreover, student members are not to participate in the debate and decision-making on matters related to examination topics or their own examinations.

(2) The members of the examination board, their deputies, the examiners as well as observers are to be sworn to official secrecy. If they are not employed in the German civil service, they are to be sworn to secrecy by the chairperson of the examination board.

(3) Negative decisions of the examination board or its chairperson are to be reported to the respective student without delay. Prior to any action, the affected student has to be granted the right to be heard.

### **Section 9 Examiners and observers**

(1) The examination board appoints examiners and observers. 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 observer if he/she has at least passed the corresponding Master's examination or a comparable examination or holds a comparable qualification (expert observer). Examiners are independent for examination purposes.

(2) For oral examinations, the examinee may suggest one or more examiners. He/she may also suggest an examiner to be his or her thesis advisor. If possible, a student's suggestion is to be considered.

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



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

- (1) Examinations and assessments completed in the same degree program within the jurisdiction of the German constitution are to be officially recognized.
- (2) Examinations and assessments completed in other degree programs within the jurisdiction of the Convention on the Recognition of Qualifications concerning Higher Education in the European Region of April 11, 1997 (Federal Law Gazette (BGBl) II 2007; p. 712 - Lisbon Recognition Convention) are to be officially recognized if it can be proven that they do not considerably differ from the examinations and assessments required. If the recognition of such examinations and assessments is denied, the university is to issue a substantiated notification on this matter.
- (3) Examinations and assessments completed in degree programs outside the jurisdiction of the Lisbon Recognition Convention are to be recognized upon request if they are equivalent to the examinations and assessments required.
- (4) Accomplishments that are not part of a degree program may be recognized as examinations or assessments upon request if they are equivalent to the examinations and assessments required. Such accomplishments may at most be recognized with up to half of the total number of examinations and assessments required for the successful completion of the program.
- (5) For examinations and assessments that have been recognized, students are awarded the number of ECTS credits stated in the curriculum (annex 2). Non-graded examinations taken at other universities or in other programs are to be recognized in accordance with sections 1 to 3. They are to be indicated accordingly on the examination certificate and are not accounted for in the calculation of the final grade. Students are obligated to disclose information on assessments and examinations taken prior to enrolling at Cologne University of Applied Sciences. If an examinee has already attempted to pass a module examination at Cologne University of Applied Sciences it is not possible to recognize an examination result from a different institution of higher education for as long as the student is enrolled at Cologne University of Applied Sciences.
- (6) The examination board is the decision-making body 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.

## **Section 11 Evaluation of examinations**

- (1) Examinations are to be evaluated in a differentiated and comprehensible manner by means of grades. Reasons for the evaluation are to be explained in writing upon request of the examination board. Grades for individual examinations are to be determined by the respective examiner.
- (2) All module examinations of the program as well as the Master's thesis and the final oral examination are graded examinations pursuant to subsection 1.
- (3) If several examiners participate in an examination, the examiners are to jointly evaluate the examination, provided that no other provisions are made hereinafter. If evaluations differ

from one another or in cases where a module examination consists of several components, the grade is the arithmetic mean of the individual components.

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

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

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

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

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

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

(6) An examination is passed if the student's performance is deemed at least "sufficient". If the module examination is made up of various individual examinations, the module is passed if all individual examinations have been passed.

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

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

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

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

(3) Students only receive credits if they have successfully completed a module. Pursuant to section 11 (2 and 6), this means that students are awarded the total number of credits for every graded module examination that has been passed with a grade of at least "sufficient", irre-

spective of the grade received for the examination. A total of 120 credits is 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 is provided in the curriculum (annex). More detailed information can be found in the module catalog.

(5) Pursuant to section 10, credits obtained in accordance with the ECTS at other universities within and outside the jurisdiction of the German constitution are to be recognized with at most the number of credits assigned in the current program, provided that the underlying examinations and assessments are deemed equivalent.

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

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

### **Section 14 Retaking examinations**

(1) Students may retake module examinations if they do not pass them or if the examinations are considered "not passed". Students are required to retake an examination in the examination period that follows the failed attempt. If the examination is not retaken within one year after the failed attempt, students will lose the right to take this examination attempt. A second retake of the examination is to take place in the examination period that follows the first retake. If the second retake of the examination does not take place within one year after the failed second attempt, students will irreversibly lose the right to take that examination. Sentences 3 and 5 are invalid if students provide evidence that they are not responsible for having missed the deadline. Times spent on a mandatory or optional semester abroad or internship and times on leave are not taken into account for the determination of the deadline for the retake according to sentences 2 and 4, i.e. the deadline is extended by the amount of time spent on leave or on a semester abroad or internship.

(2) If a student does not pass the Master's thesis or the final oral examination, he/she may retake each examination once. Module examinations may be retaken twice.

(3) An examination graded at least "sufficient" may not be retaken.

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

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

(2) The reasons stated for missing or withdrawing from an examination are to be immediately reported to the examination board, to be documented in writing and to be substantiated by the student. In case of sickness, students are required to submit a comprehensible medical certificate confirming their incapability of taking the examination. If the examination board accepts the student's explanation, he/she is to be notified that he/she may re-register for the respective examination.

(3) If a student attempts to manipulate the result of his/her examination by cheating or by using non-permissible means, the examination concerned is to be graded "insufficient" (5.0). An examinee who disrupts the proper course of an examination may be expelled from the examination by the examiner or the exam supervisor, usually after having been given prior warning. The examination concerned is to be graded "insufficient" (5.0). The reasons for the expulsion are to be put on record. If the examinee is barred from retaking the examination, he/she may request the examination board to review this decision. This also applies to the decisions of an examiner or exam supervisor in cases described in sentence 1. Possible penalties as set down in section 63 (5) of the North Rhine-Westphalia Higher Education Act are to be acknowledged.

(4) Non-permissible means are all documents and resources not explicitly allowed to be used during the examination concerned. Students are required to mark 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. Retaking an examination 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. In cases of severe plagiarism (copying of long text passages not marked as quotations) or in case of multiple or serious cheating attempts, the examination board may decide that the examination is deemed irreversibly failed.

## **II. Module examinations**

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

(1) The Master's program is divided into individual modules, each of which concludes with an examination. The content of a module may be taught in one or more courses with different methods of teaching and study. The courses of a module usually run for the duration of one semester (or, if necessary, for the duration of two semesters at the most). Pursuant to sections 19 to 22, a module examination may be subdivided into several individual examinations of the same or different type. The examinations are to determine whether students are proficient in the essential topics and methods taught in the modules and whether they are capable of independently applying the knowledge and skills acquired.

(2) On the basis of the courses offered, the examination requirements are to be aligned with the learning outcomes defined for the respective module, which are outlined in the module catalog. Students may be required to be familiar with relevant contents of previous modules. Courses and examinations may also be held in English. Detailed information is available in the curriculum (annex 1) and the module catalog.

(3) A module's type of examination depends on the requirements of the individual module. Admissible types of examination are written examinations (sections 19 and 20), oral examinations (section 21) of 10 to 30 minutes duration per examinee and other types of examination (section 22) as well as combinations of the aforementioned types of examination. A stu-

dent's total workload for module examinations 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.

(4) After consultation with the examiners concerned and in observance of the module outline and the feasibility to complete the program within the allotted time frame, the examination board is to determine the examination type and modalities for each module, usually at the beginning of each semester. If an examination within a module consists of several components or a combination of different types of examination, the examination board is also to specify how the individual components are to be weighted. The overall grade is the arithmetic mean of the individual evaluations, unless other weighting factors have been established. The examination board determines the examination period for written and oral examinations usually two months before the beginning of the examination period for all students who intend to take the module examination concerned. The examination board's decision is to be uniform and binding. For scheduled examination dates, the regulations defined in section 18 (2) apply.

(5) If other types of examination are to be taken, the examiners are to determine an examination schedule in the first quarter of the course concerned. The examination board is to be notified. The examiners are to announce the examination schedule within this period. Posting the information on the corresponding bulletin board or on an electronic examination management system is deemed sufficient. Section 18 (1) sentence 2 does not apply.

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

(1) Students are to register for examinations through the electronic registration/withdrawal system provided by the Office of Student and Examination Services within the registration period defined by the examination board. If necessary, students may also submit a written registration request to the Office of Student and Examination Services. Students are required to verify that their registration was properly recorded by consulting the appropriate registration lists. Only registered students may take the examination.

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

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

(3) In order to be admitted to a module examination, students may be required to have passed other module examinations; see section 24 and the curriculum (annex) for detailed information.

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

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

1. proof of meeting the admission requirements defined in subsections 2 and 3,

2. a statement on previous relevant examination attempts as well as on previous attempts to take the Master's examination or another final examination in the same program,
3. a statement on whether the student objects to the presence of an audience during oral examinations

If it is not possible for the examinee to submit one of the documents required according to sentence 1, the examination board may allow him/her to provide the required information in a different manner.

(6) Students may revoke their registration for a module examination in writing with the Office of Student and Examination Services or (if applicable) through the electronic registration/withdrawal system provided by the Office of Student and Examination Services up until seven days prior to the set examination date. In this case the examination will not count towards the maximum number of examination attempts.

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

- (8) Admission is to be denied if
- a) the student does not meet the requirements defined in subsections 2 to 4
  - b) documents are incomplete and the student does not submit the missing documents by the date set by the examination board
  - c) the examinee has irreversibly failed a corresponding examination in a comparable program or has irreversibly failed a Master's or other type of final examination in the same program within the jurisdiction of the German constitution.
  - d) the examinee has (within the jurisdiction of the German constitution) lost the right to take an examination deemed required by the examination regulations.

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

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

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

(3) Upon request, students are to identify themselves with a government-issued photo ID.

(4) If a student – by submitting a medical certificate or in a different manner - substantiates that he/she is not capable of completely or partly taking the examination or assessment in its intended form due to a permanent disability or chronic disease pursuant to section 3 of the German Act on Equal Opportunities for Disabled Persons (Behindertengleichstellungsgesetz), the chairperson of the examination board may extend the time frame allotted for writing an examination or the deadline for taking an examination. The chairperson may also allow the student to take an equivalent examination in a different form. If several equiva-

lent ways of offsetting a disabled person's disadvantage are considered suitable, the chairperson of the examination board is to decide on the type, date and duration of the examination at his/her discretion after having duly considered all circumstances. This provision also applies to assessments and admission tests. In exceptional cases, sentences 1 to 4 also apply to students with temporary health impairments.

(5) Examinations which conclude a program and examinations whose passing is a prerequisite for continuing a program are to be evaluated by at least two examiners.

### **Section 19 Written examinations**

(1) In written examinations the examinee is to prove that – within a limited time frame and with limited resources – he/she is capable of identifying and correctly solving problems stemming from areas covered by the module by means of common scientific methods of his/her subject field.

(2) A written examination is to be held under supervision. The examiner is to decide whether students may use additional resources.

(3) A written examination is normally drawn up by one examiner only. In specific cases, especially when a module examination covers several subject fields, the examination may also be drawn up by more than one examiner. In such a case, the examiners jointly determine prior to the examination how the individual components of the examination shall be weighted. Each examiner is to evaluate the entire written examination irrespective of the individual components and their weighting. Due to the special character of a subject field, the examination board may alternatively determine that an examiner shall only evaluate that part of a written examination that covers his/her subject field. In such a case, the examination is to be evaluated based on the previously determined weighting of the individual components. Section 18 (5) remains unaffected.

(4) Examinations requiring electronic equipment are to be treated like written examinations.

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

(1) Written examinations may be completely or partly held as multiple-choice examinations. In multiple-choice examinations, students are asked to answer questions in writing and under supervision by selecting the correct answers from a list of suggested solutions. Multiple-choice examinations may be held in modules suitable for this type of examination upon request of the examiners and with approval of the examination board.

(2) The questions asked in multiple-choice examinations are to be adapted to the knowledge and skills taught in the module concerned and need to ensure reliable examination results.

(3) It is the examiners' responsibility to determine the examination questions and the suggested solutions (examination exercises). It is to be recorded in writing which of the suggested solutions are to be accepted as correct answers.

(4) The evaluation of a written examination is to include the following information:

1. the number of questions asked and the number of questions answered correctly by the examinee,
2. the minimum number of questions required to be answered correctly in order to pass the examination,
3. in case the examination has been passed, the percentage by which the number of correctly answered questions exceeds the minimum requirements,
4. the grade obtained by the student.

(5) When grading the exams, 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 becomes evident after the examination that individual questions or possible solutions are erroneous, the examination exercises concerned will not be considered in the evaluation of the exam. As a consequence, the number of examination exercises is to be reduced. This reduced number of exercises is to form the basis of the evaluation. Reducing the examination exercises may not put students at a disadvantage.

(6) Examinations requiring electronic equipment are to be treated like written examinations.

## **Section 21 Oral Examinations**

(1) Oral examinations are to be held in the presence of an examiner and an expert observer (section 9 (1)) or in the presence of several examiners (panel examination) as group examinations or individual examinations.

(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 during oral examinations as audience, provided that there is enough space and that no examinee has objected to this provision when registering for the examination. Students may neither be present during the examiners' consultation nor during the announcement of examination results.

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

(1) In addition to written and oral examinations, other examination types are permissible. These other types include presentations, term papers, project reports and oral contributions.

(2) Other types of examination are usually evaluated by one examiner, unless one of the provisions set down in section 18 (5) applies.

(3) Presentations are to relate to the teaching and learning contents of the course. Presentations are to demonstrate a systematic approach to a topic of the respective course. Relevant literature is to be consulted. A short oral presentation of usually 15 to 30 minutes' duration is to lead to an intensive discussion on the respective topic.

(4) A term paper (e.g. a case study or research paper) is to determine whether the examinee is capable of independently completing a written technical assignment within a given



time frame, using scientific and subject-related methods. The examiner is to determine the topic and length of the paper (e.g. number of pages of the main part) at the beginning of the semester. The examinee is to be notified of the grade assigned for the term paper within three weeks of submission of the paper at the latest.

(5) A project report (final report) is to determine whether the examinee is capable of completing a written practice-based assignment within a given time frame, independently or as part of team, using scientific and subject-related methods

(6) An oral contribution (e.g. presentation, negotiation, mediation) 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 is to determine the duration of the oral contribution at the beginning of the semester. A written record of the facts that are essential for the grading of an oral contribution is to be kept. The grade is to be announced to the examinee one week after the oral contribution at the latest.

(7) Term papers and oral contributions 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, chapters, subject fields, page numbers (for term papers) or other objective identifiers allowing for a clear distinction are to be indicated.

### **III. Curriculum**

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

(1) In all compulsory modules (required and optional required modules), module examinations as described in sections 19 – 22 are to be held. The program's modules are listed in section 24; the corresponding examination types can be found in the module catalog, unless individually determined by the examination board (section 16 (4); sentence 1). During the advanced stage of the program modules and courses can be selected according to the curriculum. Additional information is available from the module catalog.

(2) The program schedule, the examination procedures and the curriculum are to be set up in such a way that it is possible for students to have taken all examinations required according to section 5 (1) by the end of their fourth semester.

(3) The examinee may take examinations in more courses than the ones needed to gain the required number of credits (additional modules). The results of these additional examinations may be listed on the examination certificate upon request of the examinee. However, they are not accounted for in the calculation of the final grade. When registering for an examination, the examinee is to determine which course is to be considered an additional module. This decision is binding. If the examinee selects more than the required number of courses from the catalog of optional required modules and passes the respective examinations, these modules are also considered additional modules. In this case, the first examinations passed are considered required examinations, unless the examinee has opted for a different arrangement prior to his/her first examination.

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

(1) Students who have selected the specialization in Software Engineering are required to pass examinations in the following modules:

1. Subject-specific Design of Software Architecture
2. Interaction Design
3. Architecture of Distributed Systems
4. Requirements Management
5. Quality Assurance

Additionally five of the following modules:

6. Specific Fields of Mathematics
7. IT-Security
8. IT-Consulting
9. Business Operations Management
10. Corporate Management
11. Specific Fields of MCI
12. Project Management (in German)
13. Project Management (in English)
14. Operations Research
15. Data Mining
16. Leadership Principles and Strategic Management
17. Databases
18. Business Administration

Only one of the two Project Management modules can count towards the required number of optional required modules, since both courses have the same content. The only difference is the language of instruction.

Additionally three project modules:

19. Guided Project 1 (Type A)
20. Guided Project 2 (Type B)
21. Guided Project 3 (Type B)

Additional information is available from the module catalog and the curriculum (annex).

(2) Students who have selected the specialization in Information Systems are required to pass examinations in the following modules:

1. IT-Compliance & Risk Management
2. Business Intelligence
3. Analytic Applications
4. Performance Management
5. Enterprise Architecture Management

Additionally five of the following modules:

6. Specific Fields of Mathematics
7. IT-Security
8. IT-Consulting

9. Business Operations Management
10. Corporate Management
11. Specific Fields of MCI
12. Project Management (in German)
13. Project Management (in English)
14. Operations Research
15. Data Mining
16. Leadership Principles and Strategic Management
17. Databases
18. Business Administration

Only one of the two Project Management modules can count towards the required number of optional required modules, since both courses have the same content. The only difference is the language of instruction.

Additionally three project modules:

19. Guided Project 1 (Type A)
20. Guided Project 2 (Type B)
21. Guided Project 3 (Type B)

Additional information is available from the module catalog and the curriculum (annex).

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

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

(1) The Master's thesis is to be submitted as a written paper. It is to provide evidence that the examinee is capable of independently completing an assignment on a subject from his/her field of study within a given time frame by elaborating on subject-related specifics as well as on interdisciplinary contexts and by making use of scientific and subject-related methods. When writing their Master's thesis, students should take an interdisciplinary collaboration into consideration.

(2) The topic of the Master's thesis may be determined by any professor who can be appointed as examiner in accordance with section 9 (1). This examiner may also function as the thesis adviser. Upon request of the examinee, the examination board may also name an adjunct professor (*Honorarprofessor/in*) or a qualified adjunct lecturer (*Lehrbeauftragte/r*) as thesis adviser in accordance with section 9 (1) if it has been determined that no professor of the faculty is able to function as thesis adviser for the intended topic of the Master's thesis. If endorsed 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 assistance and advice. Students are to be given the opportunity to suggest topics for their Master's thesis. Examiners from other faculties may be chosen as thesis advisers if the topic of the thesis so allows.

(3) Upon request, the chairperson of the examination board ensures that an examinee is provided with a topic for the Master's thesis in time.

(4) A Master's thesis may be written in the form of a joint team project if the individual student's contribution to be evaluated is clearly distinguishable and can be assessed accord-

ingly and meets the requirements stated in section 1. In order to verify the student's contribution, it must be clearly indicated and distinguishable which parts of the project, passages, pages (or similar) he or she contributed.

(5) If endorsed by the chairperson of the examination board and the main examiner, the Master's thesis may be written in English.

## **Section 26 Registration for the Master's thesis**

(1) Students may register for the Master's thesis if they meet the admission requirements stated in section 17 (2 and 5) and have, pursuant to section 12, obtained a total of 75 credits in the examinations required according to section 24.

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

1. proof of meeting the admission requirements stated in subsection 1
2. a statement on previous attempts to write a Master's thesis or another final examination and on attempts to take the Master's examination.
3. a statement on which examiner is willing and able to prepare the topic of the Master's thesis and to function as thesis adviser, and
4. 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) Admission to the Master's thesis is decided upon by the chairperson of the examination board and, in cases of doubt, the examination board itself. Admission is to be denied if

- a) the student does not meet the requirements stated in subsection 1
- b) the required supporting documents are incomplete or
- c) if the examinee has previously written a final thesis within the jurisdiction of the German constitution, which was graded "insufficient" or if the student has irreversibly failed one of the examinations stated in subsection 2, phrase 2, no. 2.

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

## **Section 27 Assignment of the topic and writing 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 adviser. The time of assignment is to be put on record.

(2) Students have 23 weeks to write the Master's thesis (starting with the time of assignment to the day of submission). The topic and assignment must be designed in a way that

allows for the Master's thesis to be completed within this time frame. In exceptional cases, the chairperson of the examination board may extend the deadline of submission by up to four weeks if the student submits a request prior to the deadline, in which he/she explains the reasons for his/her request. The thesis adviser is to be consulted on the request.

(3) Students may withdraw from a topic of their Master's thesis only once and only within the first four weeks of the assigned time frame. They are not required to state a reason for doing so. If a student undertakes a second attempt to write a Master's thesis in compliance with section 14 (2), the student is only permitted to withdraw from the thesis if he/she did not do so during his/her first attempt.

(4) Section 18 (4) applies accordingly.

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

(1) Students are to submit three hardcover copies of their Master's thesis and one electronic copy in a common word processing format to the chairperson of the examination board, or at a location determined by the chairperson, by the submission deadline. Submitting the thesis electronically is not permitted. In addition, students are to transmit their Master's thesis to the website specified by the Office of Student and Examination Services in order to have it checked for plagiarism. The time of submission is to be put on record; if the thesis is submitted by mail, the decisive criterion is the point in time when the thesis is submitted to the postal service. When submitting the thesis, the student is required to declare in writing that he/she has written the thesis himself/herself – in case of a joint team project his/her part of the thesis, which can be clearly identified – and has used no other than the sources and means listed in the paper. Sources of quotations are to be identified in the text.

(2) The Master's thesis is to be evaluated by two examiners. One of the examiners is to be the thesis adviser. The other examiner is to be determined by the examination board. If section 25 (2) sentence 3 applies, he/she must be a professor. If the examiners' evaluations differ from each other and the divergence of both grades is less than 2.0, the grade for the Master's thesis is the arithmetic mean of the two grades. If there is a divergence of 2.0 or more, the examination board is to appoint 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 assigned 24 credits in accordance with section 12.

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

(1) The final oral examination complements the Master's thesis. It is to be evaluated as an independent examination and is to be held within six weeks of submission of the Master's thesis. It is to determine whether the student is capable of orally presenting and independently justifying the findings of the Master's thesis, its scientific and methodological fundamentals as well as inter- and multidisciplinary contexts and of assessing the thesis' significance for practice.

(2) Students may only be admitted to the final oral examination if they

- have passed all module examinations,

- are enrolled or have been offered admission as regular or cross-registered students in accordance with section 52 (2) of the North Rhine-Westphalia Higher Education Act
- have received a grade of at least "sufficient" for their Master's thesis.

Students are required to submit a written registration for the final oral examination to the Office of Student and Examination Services. They are also required to submit proof of meeting the admission requirements stated in subsection 2, unless the Office of Student and Examination Services is already in possession of such proof. In accordance with section 26, students may already register for the final oral examination when registering for the Master's thesis; in this case, students are admitted to the final oral examination as soon as all required proof and documents have been submitted to the Office of Student and Examination Services.

- (3) The final oral examination is usually held and evaluated by the examiners of the Master's thesis. If section 28 (2) applies, the final oral examination is held by those examiners whose evaluations were used to calculate the grade for the Master's thesis
- (4) The duration of the final oral examination is approximately 30 minutes. The provisions defined for oral examinations (section 21) apply accordingly.
- (5) The final oral examination may be retaken once.
- (6) In accordance with section 12, a total of 30 credits are assigned for passing the Master's thesis and the final oral examination.
- (7) In accordance with section 12, a total of 30 credits are assigned for passing the Master's thesis and the final oral examination. 24 credits are assigned for the written part (Master's thesis). 6 credits are assigned for the oral part (final oral examination).

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

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

- (1) The examinee has passed the Master's examination if he/she has obtained 120 credits. 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.
- (2) The examinee has failed the Master's examination if one of the examinations stated in subsection 1 has been irreversibly graded "insufficient" or is irreversibly deemed "insufficient". Students are to be notified of having failed the Master's examination. This notification is to include information on legal remedies. Upon request the chairperson of the examination board will issue an official document listing the examinations and assessments taken by the student and their respective grades, as well as the examinations missing in order for the student to complete the Master's examination. This 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 assessments and their respective grades.

### **Section 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 examination. This examination certificate is to include the grades and credits for all module examinations, the topic of the Master's thesis, the grades and credits for the Master's thesis and the final oral examination, the final grade for the Master's examination and - for transferred grades or recognized assessments from other universities - 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 by the corresponding credits. If the examinee has selected more than the required number of optional required modules and passed the respective examinations with a grade of "sufficient" or better, only those grades will be used for the calculation of the final grade that the examinee has identified accordingly when he/she registered for the examination. If the student has not identified any examinations, the grades assigned for the module examinations that were taken first will be used for in the calculation of the final grade.
- (3) As stated in section 23 (3), grades for additional modules are not accounted for in the calculation of the final grade.
- (4) The examination certificate is to be signed by the chairperson of the examination board and is to bear the date of the day on which the last examination was completed.
- (5) Graduates 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 confirms that the Master's degree has been awarded in compliance with section 2 (4).
- (6) The Master's certificate is to be signed by the dean of the Faculty of Computer Science and Engineering Science and the chairperson of the examination board and is to bear Cologne University of Applied Sciences' seal.
- (7) In addition to the Master's certificate and the examination certificate, graduates are to receive an English-language diploma supplement which corresponds to the guidelines and agreements of the German Rectors' Conference.

## **VI. Final provisions**

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

After taking a module examination or completing the Master's thesis and the final oral examination, the examinee may inspect (upon request) the exam papers of the respective written examination concerned, of the examiners' records related to the examination (if available) and of the examination records of an oral examination. The inspection of a Master's thesis that was graded at least "sufficient" is only possible after the corresponding final oral examination. Access to these documents is to be requested with 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 is to determine time and place of the inspection.

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

(1) If a student cheated during an examination and the cheating is detected only after the examination certificate and the documents mentioned in section 30 (2) sentences 4 and 5 and section 31 (1/6) were 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 in this matter and if this situation is detected only after the examination certificate or the document mentioned in section 30 (2) sentences 3 and 4 and section 31(1/6) was issued, this shortcoming is offset by the student's passing of the examination. If the student deliberately effected a wrongful admission, the examination board is to decide on the legal consequences with due regard to the Administrative Procedures Act (*Verwaltungsverfahrensgesetz*) of North Rhine-Westphalia.

(3) If necessary, the incorrect examination certificate, the Master's certificate and the diploma supplement or the incorrect certification as per section 30 (2), sentences 3 and 4 are to be collected and reissued. A decision pursuant to subsection 1 is to be ruled out if ten years or more have passed since the examination certificate or document as per section 30 (2) sentences 3 and 4 was issued.

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

(1) These examination regulations enter into force on September 1, 2013 and are to be published in Cologne University of Applied Sciences' official communication (*Amtliche Mitteilungen*).

(2) These examination regulations apply to all students who enroll in or apply for admission to the Master's program in Informatik/Computer Science at Cologne University of Applied Sciences in the winter semester 2013/14 or later.

(3) Students who have enrolled in the Master's program in Computer Science at Cologne University of Applied Sciences prior to the winter semester 2013/14 will be given opportunity to continue their studies as planned and to graduate by the end of the winter semester 2015/16 at the latest. The examination board will decide on separate regulations on how to proceed in these cases. The examination regulations for the Master's program in Computer Science at Cologne University of Applied Sciences of February 13, 2008 will cease to be in force as of February 28, 2016.

(4) The examination regulations are published on the basis of the resolution of the Faculty Council of the Faculty of Computer Science and Engineering Science at Cologne University of Applied Sciences of November 6, 2013 and after legal review by the President's Office of Cologne University of Applied Sciences November 13, 2013.



Cologne, November 15, 2013

The President  
of Cologne University of Applied Sciences

(Prof. Dr.-Ing. Chr. Seeßelberg)

**Annex:**

Curricula (Software Engineering and Information Systems)

Translated on April 11, 2017 by Michèle Lohr (Conference Interpreter, M.A.), Translator at the Department of Academic Affairs at TH Köln – University of Applied Sciences.

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.

# Curriculum for the Master's program in Informatik/Computer Science - Software Engineering

No.	Module		Language	WS/SS	1 <sup>st</sup> + 2 <sup>nd</sup> semester 60 ECTS Credits				3 <sup>rd</sup> semester 30 ECTS credits		4 <sup>th</sup> semester 30 ECTS credits	
	REQUIRED MODULES:	ECTS			ECTS credits: 30 ECTS credits				V	Ü	S	
SE1	Subject-specific Design of Software Architecture	6	DE	WS	X *		2	2				
SE2	Interaction Design	6	DE	WS	X *	1	1	2				
SE3	Architecture of Distributed Systems	6	DE	SS	X *	2	2					
SE4	Requirements Management	6	DE	SS	X *		2	2				
SE5	Quality Assurance	6	DE	SS	X *	2	1	1				
	<b>ELECTIVES:</b>	<b>ECTS</b>			<b>ECTS credits: 30</b>				<b>V</b>	<b>Ü</b>	<b>S</b>	
W1	Specific Fields of Mathematics	6	DE	WS	X **	2		2				
W2	IT-Security	6	DE	WS	X **	2		2				
W3	IT-Consulting	6	DE	WS	X **	2	2					
W4	Business Operations Management	6	DE	WS	X **	2		2				
W5	Corporate Management	6	DE	WS	X **	2		2				
W6	Specific Fields of MCI	6	DE	SS	X **		2	2				
W7a	Project Management (in Ger.)	6	DE	SS	X **	2		2				
W7b	Project Management (in Eng.)	6	EN	WS	X **	2		2				
W8	Operations Research	6	EN	WS	X **	2	2					
W9	Data Mining	6	EN	WS	X **	2	2					
W10	Leadership Principles and Strategic Management	6	EN	SS	X **	2	2					
W11	Databases	6	EN	SS	X **	2		2				
W12	Business Administration	6	EN	SS	X **	2		2				
	<b>PROJECTS</b>	<b>ECTS</b>							<b>ECTS credits: 30</b>		<b>S</b>	
GP1A	Guided Project 1 (Type A)	14	DE / EN	WS/SS					X	4		
GP2B	Guided Project 2 (Type B)	8	DE / EN	WS/SS					X	2		
GP3B	Guided Project 3 (Type B)	8	DE / EN	WS/SS					X	2		
	<b>FINAL THESIS</b>	<b>ECTS</b>									<b>ECTS credits: 30</b>	
TH	Master's thesis & Final Oral Examination	30	DE / EN	WS/SS							X	

\* Required Module

\*\* Optionale Module (Elective)

DE: Language of Instruction is German
Module is offered separately in German and English. Only one of the two courses can be recognized.
EN Language of instruction is English.
DE / EN: Language of instruction is German or Eng

Module schedule
WS: Module is offered each winter semester
SS Module is offered each summer semester
WS / SS: Module is offered each winter and summer semester

Weekly on-site classes
V: Lecture
Ü: Lab/Tutorial
S: Seminar

# Curriculum for the Master's program in Informatik/Computer Science - Software Engineering

No.	Module		Language	WS/SS	1 <sup>st</sup> + 2 <sup>nd</sup> semester 60 ECTS credits				3 <sup>th</sup> semester 30 ECTS credits		4 <sup>th</sup> semester 30 ECTS credits
					ECTS	ECTS credits: 30 ECTS credits	V	Ü	S	ECTS credits: 30 ECTS credits	V
	REQUIRED MODULES:		ECTS								
SE1	IT-Compliance & Risk Management		6	EN	WS	X *	2	2			
SE2	Business Intelligence		6	EN	WS	X *	2		2		
SE3	Analytic Applications		6	EN	SS	X *	1	2	1		
SE4	Performance Management		6	EN	SS	X *	2		2		
SE5	Enterprise Architecture Management		6	EN	SS	X *	1	2	1		
	ELECTIVES:		ECTS								
	ECTS credits: 30 ECTS credits						V	Ü	S		
W1	Specific Fields of Mathematics		6	DE	WS	X **	2		2		
W2	IT-Security		6	DE	WS	X **	2		2		
W3	IT-Consulting		6	DE	WS	X **	2	2			
W4	Business Operations Management		6	DE	WS	X **	2		2		
W5	Corporate Management		6	DE	WS	X **	2		2		
W6	Specific Fields of MCI		6	DE	SS	X **		2	2		
W7a	Project Management (in German)		6	DE	SS	X **	2		2		
W7b	Project Management (in English)		6	EN	WS	X **	2		2		
W8	Operations Research		6	EN	WS	X **	2	2			
W9	Data Mining		6	EN	WS	X **	2	2			
W10	Leadership Principles and Strategic Management		6	EN	SS	X **	2	2			
W11	Databases		6	EN	SS	X **	2		2		
W12	Business Administration		6	EN	SS	X **	2		2		
	PROJECTS		ECTS						ECTS credits: 30	S	
GP1A	Guided Project 1 (Type A)		14	DE / EN	WS/SS				X	4	
GP2B	Guided Project 2 (Type B)		8	DE / EN	WS/SS				X	2	
GP3B	Guided Project 3 (Type B)		8	DE / EN	WS/SS				X	2	
	FINAL THESIS		ECTS								ECTS credits: 30
TH	Master's thesis & Final Oral Examination		30	DE / EN	WS/SS						X

\* Required Module

\*\* Optionale Module (Elective)

DE: Language of Instruction is German
Module is offered separately in German and English. Only one of the two courses can be recognized.
EN Language of instruction is English.
DE / EN: Language of instruction is German or Eng

Module schedule
WS: Module is offered each winter semester
SS Module is offered each summer semester
WS / SS: Module is offered each winter and summer semester

Weekly on-site classes
V: Lecture
Ü: Lab/Tutorial
S Seminar