

Examination Rules for the Masters Degree Course in Computer Science

at the Faculty of Mathematics and Natural Science at the
Rheinische Friedrich-Wilhelms-Universität, Bonn

3rd statute

On the basis of § 2, par. 4, and § 64, par. 1, of the laws governing higher education in the Federal State of Nordrhein-Westfalen - Hochschulgesetz (HG = law governing higher education institutions) - in the version of the Hochschulfreiheitsgesetz (HFG = law for greater autonomy for higher education institutions) dated 31.10.2006 (GV. NRW p. 474), the Faculty of Mathematics and Natural Science at the Rheinische Friedrich-Wilhelms-Universität Bonn has issued the following examination rules:

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Annex 1: Regulations governing the determination of special course-related suitability

Annex 2: Module plan

§ 1 Aim of the Course and Purpose of the Examination

(1) The Masters Degree Course in Computer Science is offered by the Faculty of Mathematics and Natural Science at the Rheinische Friedrich-Wilhelms-Universität Bonn, is consecutively structured and has a research-based profile.

(2) The Masters Degree examination leads to a higher graduation as a result of a more in-depth, research-related scientific education in the Computer Science course.

3) Students will learn how to tackle complex problems and how to solve them by scientific methods reaching even beyond the current limits of knowledge.

(4) This Masters Degree Course is designed to provide students with the required expert knowledge, skills and methods as well as interdisciplinary key qualifications, taking into account the requirements and changes in the professional world, in order to enable them to work scientifically, to classify and utilise scientific discoveries in a critical manner and to act responsibly. The course objectives focus primarily on

- a) gaining expert knowledge orientated towards current research problems on the basis of a more in-depth level of fundamental knowledge,
- b) obtaining methodical and analytical expertise enabling students to widen the scope of their scientific discoveries in an independent manner, with research methods and strategies being of central importance,
- c) obtaining career-relevant key qualifications.

(5) In order to help students plan their course structure expediently, a degree course scheme will be recommended to them. Individual students may request an individual study plan.

(6) Lectures will be held in English. For individual modules, the module plan may provide German as the lecture language.

§ 2 Academic Degree

Once students have passed the Masters examination, the Faculty of Mathematics and Natural Science at the Rheinische Friedrich-Wilhelms-Universität Bonn will award them the academic degree of Master of Science (M. Sc.) in Computer Science.

§ 3 Entrance Requirements

(1) The Masters Degree course in Computer Science is orientated towards applicants able to meet the following entrance requirements:

1. successful completion of a first graduation course in computer sciences or a related subject,
2. a sufficient command of the English language according to TOEFL 550 or Computer TOEFL 213 (Test of English as a Foreign Language), IELTS 6.0 (International English Language Testing System) or an equivalent certification,
3. a pass in an examination for determining their specific course-related suitability, as regulated in Annex 1 to the present examination rules.

(2) Any capacity-related admission restrictions (Numerus clausus) remain unaffected.

§ 4 Standard Period of Study, Study Plan, Scope of Teaching

(1) The standard period of study is 4 semesters, including the Master Thesis. The study contents are selected and limited in such a way that the Masters examination can be completed within the regular period of study.

(2) The study contents are selected and limited in such a way that the Masters examination can be completed within the regular period of study. They will be taught in the form of modules which, as a rule, consist of teaching units of a semester, which are interrelated to each other with regard to their topics, their methods or their systems.

(3) Each module will be completed by a module test and will be evaluated on the basis of score points (ECTS-points) in accordance with the ECTS (*European Credit Transfer and Accumulation System*). Each ECTS-point corresponds to a calculated student workload of 30 hours.

(4) The course comprises modules worth a total of 120 ECTS-points. Of these, 88 ECTS-point may be obtained from modules of the range of obligatory optional subjects. The Master Thesis is potentially worth 30 ECTS-points, and the associated accompanying seminar is worth 2 ECTS-points. No later than after the second semester, each student will select as his/her course emphasis one of four possible areas, from which at least 49 and no more than 58 ECTS-points will have to be obtained. The remaining 30 to 39 ECTS-points may be obtained from modules in the other areas - at least 6 ECTS-points must be obtained from at least two of the three remaining areas. In the area the student has selected as his/her course emphasis, one seminar worth 4 ECTS-points and one lab worth 9 ECTS-points must be completed successfully. No more than 10 ECTS-points can be obtained from seminars; no more than 18 ECTS-points can be obtained from labs. The details regarding the modules, their admission requirements and the number of score points per module are set out in Annex 2. The emphasis selected may be changed, prior to the issue of the topic of the Master Thesis, upon a substantiated request to the Examination Board.

(5) The course may be started in either the summer or the winter semester. If the course is started in the summer semester, it is obligatory to make use of the course guidance service prior to beginning the course.

§ 5 Admission to the Individual Lectures

(1) If, in an individual case, the number of participants in a lecture needs to be limited due to its nature or purpose or for any other research or teaching-related reason and the number of applicants exceeds the capacity, the Dean of the faculty to which the associated module is allocated will, upon the lecturer's request, regulate the participation in accordance with § 59 HG.

(2) The module plan set out in Annex 2 lays down the details regarding the number of possible participants and the admission priorities.

§ 6 Examination Office and Examination Board

(1) The Faculty of Mathematics and Natural Science has established an Examination Office for the organisation of the examinations and the tasks allocated by the present examination rules. This office is headed up by the Dean. The Dean delegates certain discipline-related tasks set out in the present examination rules to the Examination Board of the Computer Science Teaching Unit. This Board will act as an agency of the Examination Office when carrying out these tasks.

(2) The Examination Board is an authority in terms of the administrative procedure law (*Verwaltungsverfahrensgesetz*) and the administrative process law (*Verwaltungsprozessgesetz*).

(3) The Dean will ensure that the regulations of the examination rules are adhered to and that examinations are conducted properly. He/she is responsible, in particular, for making decisions with regard to any appeals against decisions made in examination procedures.

(4) Any directives, fixing of dates and other communications of the Examination Office which do not only relate to individuals, will be notified on a notice board or in electronic form under consideration of the Data Protection Act with legally binding effect. Any other notices are admissible, but not legally binding.

(5) The Examination Board consists of a Chairman, a Deputy Chairman and three additional members. The Chairman, the Deputy Chairman and one other member will be elected from the group of professors; one member is elected from the group of scientific employees; and one member will be elected from the group of students of the Master Degree course in Computer Science by the Faculty Council.

(6) Individuals eligible for election to the Examination Board are those professors and academic employees who were or are actively lecturing in the academic year preceding the selection or in the current academic year. Out of the group of students, those enrolled for the course are electable and eligible to vote. One representative is elected for each member. The term of office of the members from the group of professors and from the group of academic employees is three years; the term of office of the student member is one year. Members may be re-elected.

(7) The Examination Board has a quorum if, apart from the Chairman or the Deputy Chairman, at least two other members eligible to vote or their representatives are present. Decisions are made on the basis of a simple majority. In the case of the votes being equal, the Chairman will have the casting vote. The student member of the Examination Board will not participate in the evaluation and recognition of study periods or of study and exam performances, the setting of examination tasks or the appointment of examiners and assessors. The members of the Examination Board have the right to attend the examination hearings.

(8) The meetings of the Examination Board are not public. The members of the Examination Board, their deputies, the examiners and the assessors are bound by official secrecy. Unless they are civil servants, they have to be bound to secrecy by the Chairman of the Examination Board. The results of the consultations of the Examination Board have to be minuted.

(9) The Examination Board will report to the Faculty Council on a regular basis, at least once a year, regarding the development of the examination and study periods including the duration of the Master Thesis. They will give advice with regard to changes to the examination rules and the study plans and will disclose the distribution of module marks and overall marks.

§ 7 Examiners and Assessors

(1) The Examination Office appoints the examiners and the assessors for the individual examinations upon proposals by the respective Examination Board. Individuals authorised to hold university examinations are those lecturing at Bonn University and those experienced in occupational practice and education, in as far as this is necessary or expedient in order to achieve the purpose of the examination. Examination performances may be evaluated only by individuals who themselves have at least the qualification to be established by this examination or an equivalent qualification. Only individuals may be appointed as assessors who have passed at least the corresponding Master or Diploma examination or another equivalent examination.

(2) Module tests are conducted by the respective tutors responsible for each module. If a tutor is not able to conduct a module test at the right time due to illness or for any other important reason, the Examination Board will ensure that another examiner is appointed to hold this module test. This examiner should have previously given independent lectures relating to the module concerned.

(3) In their examination activity, examiners are independent of instructions.

(4) The candidate may suggest the examiners for the Master Thesis. Wherever possible, such suggestions should be considered; they do not, however, constitute a claim.

(5) The Chairman of the Examination Board will ensure that the candidate is notified about the names of the examiners in good time, no later than two weeks prior to the date of the respective examination..

§ 8 Recognition of Course and Examination Achievements

(1) Any performances achieved in a degree course at a different higher education institution within the area of validity of the Basic Law for the Federal Republic of Germany will be recognised ex officio in the same degree course without any equivalence testing.

(2) Any achievements made in other degree courses or at another higher education institution or at a public or publicly recognised professional academy within the area of validity of the Basic Law for the Federal Republic of Germany will be recognised, provided they are equivalent. This also applies, upon application, to performances achieved at universities outside of the area of validity of the Basic Law. When establishing equivalence, the equivalence agreements approved by the Standing Conference of the Ministers of Education and Cultural Affairs and the German Rectors' Conference, as well as agreements within the context of university partnerships, apply. Equivalence shall be regarded as established if achievements with regard to content, scope and requirements essentially correspond to those required. In doing so, an overall consideration and overall evaluation shall be carried out rather than a schematic comparison. With regard to achievements made in additional studies, the above regulations apply correspondingly.

(3) Additional prior knowledge and qualifications may be recognised, upon application, on the basis of documents submitted with regard to this course of studies.

(4) The academic degree of "Master of Science" will be awarded by the Faculty only if both the sum total of at least 45 of the performance scores to be achieved in the obligatory options area according to § 4, par. 4, as well as the 30 ECTS-points of the Master Thesis at Bonn University have been acquired.

(5) The Examination Board is responsible for recognitions in accordance with paragraphs 1 to 3. Prior to making any decisions with regard to equivalence, the Board shall consult representatives of the specialist areas concerned. Moreover, in the case of any doubts about course equivalence and examination performances achieved abroad, the Central Office for Foreign Education Matters (Zentralstelle für ausländisches Bildungswesen) may be consulted.

(6) Where any achievements are recognised, the marks – in as far as the marking systems are comparable – will be adopted and weighted with the associated ECTS-points and included in the overall mark. In the case of marking systems that cannot be compared, the note "passed" (bestanden) will be included. The recognition will be identified in the report. Any performances achieved in courses of studies without an ECTS-point scoring system will be converted into ECTS-points by the Examination Office, provided the corresponding examination corresponds to modules in accordance with the present examination rules. In this connection, the benchmark approved by the Standing Conference of the Ministers of Education and Cultural Affairs (Kultusministerkonferenz) for the comparison with ECTS shall be used as the basis. As a rule, any partial achievements in a module cannot be recognised; in individual cases the Examination Board may allow exceptions in cases where the application is substantiated.

(7) Once the criteria set out in paragraphs 1 to 3 are met, there is a legal claim for recognition. Students have to submit any documents required for recognition and have to provide corresponding information. The Examination Board may demand a declaration from the student that all achievements that are to be recognised have been disclosed. Recognition may be refused if an applicant fails to cooperate.

§ 9 Scope of the Masters Examination and Examination Dates

(1) The Masters examination is designed to provide a higher graduation as a result of a more in-depth, research-related scientific education in the discipline of Computer Science.

(2) The Masters examination consists of:

- the course-concomitant module tests relating to the teaching contents of the modules specified in Annex 2, and
- the Master Thesis.

All exams should be sat within the set period of time for completion of studies established in § 4, par. 1.

(3) All exams will be held in parallel with the course of studies. A module test is allocated to each module, even if the module consists of several events. Once this examination has been passed, the score points of the module will be credited. For all module tests carried out in the form of written papers or oral exams, two exam dates will be set within the semester in which the module is completed. As a rule, the first examination date will be shortly before or shortly after the lecture time in the respective semester. The second exam date will, as a rule, be at the end of the corresponding semester. The results of written exam performances will be communicated to the candidate no later than after six weeks, and the results of the Master Thesis no later than after eight weeks.

(4) In principle, the exams will be held in the language of the lectures. Any exams or exam parts may, on application by the candidates and upon agreement with the respective examiner(s), also be held in another language related to the course of study. However, candidates have no right to demand parts of the exam in their chosen language. Details are laid down in the module specifications.

§ 10 Enrolment and Admission, Deadlines

(1) Each module exam requires a special enrolment with the Examination Board. Both the exam dates and the enrolments dates will be announced on a notice board or by electronic means. These are deadlines. Candidates have the right to withdraw their enrolment from the respective exam date in writing, without stating any reasons, no later than one week prior to the respective exam date. The date of receipt of the notice at the Examination Office shall apply. In the case of courses in which the exams are spread over the semester, a notice of withdrawal from the exam is no longer possible once topics and/or places have been issued. The university reserves the right to introduce the option of enrolment by electronic means. Once this option becomes available, details will be notified by the Examination Office. If a candidate fails a module exam, the enrolment for this exam will automatically apply to the next possible exam date, and a withdrawal from such an exam is not possible.

(2) Admissions to module exams are only possible for individuals who

1. meet the general admission criteria as specified in § 3;
2. are enrolled as regular students at Bonn University for the course of studies in computer science or are admitted according to § 52, par. 2 HG, as guest students (Zweithörer);
3. meet any special admission criteria set for the module, including any number limitations.

(3) Applications for admission to the Masters examination must be submitted in the first semester and should be addressed in writing to the Examination Office, together with the enrolment for the first module exam. The following must be attached to the application:

- a) evidence that the admission criteria mentioned in par. 2 have been met,
- b) a declaration as to whether the candidate has failed or finally failed an examination or the Masters examination for this course of studies or in a related or comparable course of studies or is currently participating in another examination procedure for such a course of studies.

(4) When enrolling for the Master Thesis, the candidate has to provide evidence of having successfully completed the required modules and has to state before which representatives of the relevant subject they would like to carry out the work.

(5) If the candidate cannot provide any of the documents required according to par. 3, p. 2 in the prescribed manner, the Examination Board may allow the candidate to provide evidence by means other than by providing the documents.

(6) The Examination Board shall decide whether admission is to be granted.

(7) Admission may be rejected only if

- a) the criteria mentioned in par. 2 are not met,
- b) the documents according to par. 3 are incomplete and/or are not submitted even after requests to do so,
- c) the student has finally failed an examination or the Masters examination in this course of studies or in a related or comparable course of studies, or
- d) the student is currently in another examination procedure in this course of studies or in a related or comparable course of studies.

§ 11 Implementation of Examinations during the Course of Studies

(1) Module exams relate to the teaching contents of the modules mentioned in Annex 2.

(2) During the module exams, the students must be enrolled for this course of studies.

(3) In the module exams, theoretical knowledge about the taught subject areas that was acquired within the course of the respective module, as well as ability to understand wider relationships are checked. As a rule, the module exams take the form of a written paper or of an oral exam. The exam forms possible in each case, as well as the admission conditions, will be set out in the module plan. The concrete form of the exam will be determined in agreement with the examiners and will be communicated by the Examination Board in good time prior to the beginning of the respective semester. For modules of a lecture type including exercises, it is admissible to demand in the module plan regular and successful participation in the exercises as an admission condition for written or oral module exams.

(4) For all module exams to be carried out in the form of written papers or oral exams, two exam dates will be offered within the semester in which the module is completed. Candidates, who do not pass the module exam in the first instance, may re-sit the exam on the second date. If the exam result required for passing is not achieved on either of the two dates, the module exam will be regarded as failed. As a rule, the exam dates will be set shortly before and shortly after the end of the lecture time of the respective semester. The dates will be communicated by the Examination Board in good time on a notice board or by electronic means.

(5) Examination results in seminars will relate, as a rule, to written papers and oral discourses relating to partial areas of the subject matter dealt with in the seminar. Exams in practical training

and in project seminars comprise as a rule the independent handling, documentation and presentation of a project, which may also include cooperation with the occupational practice. Group work is possible, provided it does not prevent a differentiated evaluation of each individual candidate's performance. In the case of seminars and practical training, regular attendance will be a condition for admission to a module exam.

(6) If a candidate is able to satisfy the Examination Board by providing appropriate proof to show that due to a permanent reason or a reason lasting for more than one semester, or due to a chronic disease, they are not able to sit the exam wholly or partially in the specified form, the Examination Board will allow the candidate to provide an equivalent course and/or examination performance in a form which meets the necessary requirements and, where necessary, also within a correspondingly extended working time.

§ 12 Re-sitting of Exams

(1) Each module exam which is failed or regarded as failed, may be re-sat up to two times. Any failed attempts in the same or a related or comparable module or course of studies at other universities will be taken into account. If necessary, the Examination Board will establish which modules or courses of studies shall be regarded as equivalent.

(2) If a candidate fails to appear for a re-sit without providing an apology, the exam will be evaluated as "nicht ausreichend" (5.0) (inadequate).

(3) If an obligatory optional module is not passed even after a second re-sit, the candidate has the option of selecting a new obligatory option module which has not previously been selected. Once all the compensation options are exhausted, the candidate will lose their right to an examination and will be exmatriculated.

(4) A module exam marked at least "ausreichend" (4.0) (adequate) cannot be re-sat. However, a maximum of three module exams successfully completed within the first year of study, may each be re-sat once for result improvement in the next semester the relevant module is taught again. In this case, the student has to file a written request to the Examination Board no later than three months before the relevant module exam is intended to be re-sat (i.e. three months before the relevant examination date). An admission to re-sitting a module exam for result improvement will be granted without another successful participation in the exercises of the module. The more adequate examination result will be effective. The less successful attempt will be counted as "not occurred". By request, the re-sitting of a module exam for result improvement may also take place at the second attempt of the module exam in the relevant semester, if the module exam has already been successfully completed at the first attempt. The request needs to be filed to the examination board no later than two weeks after the first attempt's exam results have been published. More than one re-sitting of a successfully completed module exam will not be granted.

§ 13 Protection Regulations, Default, Withdrawals, Deception, Rule Violations

(1) An examination result will be marked "nicht ausreichend" (5.0) (inadequate) if a candidate misses an exam date without a valid reason, withdraws from the examination without a valid reason after the start of the exam or does not hand in the Masters Thesis within the specified period. The same applies if a written exam paper is not handed in within the specified handling period. The candidate may withdraw from a module exam by writing to the Examination Board no later than one week prior to the respective exam date. The date of receipt by the Examination Board shall apply.

(2) The reasons stated for the withdrawal or default have to be immediately indicated to the Examination Board in writing and have to be substantiated. If a candidate falls ill, they may be

required to submit a medical certificate containing the medical results which the Examination Office will need in order to determine the candidate's inability to sit the exam. In individual cases, the Chairman of the Examination Board may require the submission of medical certificates issued by an independent medical examiner appointed by the Examination Office or by a Medical Officer. If the Examination Board recognises the reasons given, this will be treated as if no attempt had been made to sit the exam.

(3) If an attempt is made to influence the result of the exam by deception or by using inadmissible aids, the respective exam performance will be evaluated as "nicht ausreichend" (5.0) (inadequate). This will be determined by the respective examiner or invigilator, put on record and passed onto the Examination Board. A candidate who disturbs the proper running of the exam may, upon admonition, be excluded by the respective examiner or invigilator from continuing with the exam. In this case the respective exam will be declared failed and will be evaluated as "nicht ausreichend" (5.0). The reasons for the exclusion will be put on record.

(4) Candidates may demand within two weeks that decisions according to par. 3, sentences 1 and 2, be reviewed by the Examination Office.

(5) Maternity periods as established in the Maternity Protection Act (MuSchG) applicable at the time shall be duly taken into consideration on application by the candidate. The application must be accompanied by necessary evidential documents. Maternity periods will put on hold any deadlines in accordance with these examination rules; the maternity period will not be included in the period of the deadline.

(6) Parental leave periods, as stipulated in the laws applicable at the time with regard to parental allowances and parental leave (BEEG), are also to be considered upon application. Candidates will have to notify the Examination Office in writing no later than four weeks prior to the date on which they wish to commence their parental leave about the period or periods of time for which they wish to claim their parental leave. This notification shall be accompanied by the necessary evidential documents. The Examination Office is responsible for checking whether the legal requirements which, in the case of the employee, would initiate a right to parental leave according to BEEG are met, and will immediately communicate to the candidate the results as well as, if applicable, the newly fixed examination periods. The working period for a Master Thesis cannot be put on hold during parental leave. The task set will be regarded as not allocated. At the end of the parental leave period, the candidate will be given a new topic.

(7) Default periods due to caring for or looking after spouses, registered life partners, relatives in straight succession or persons related by marriage in the first degree, if they are in need of care or looking after, shall be considered upon application. The Examination Office is responsible for checking whether the criteria according to sentence 1 are met. The application shall be submitted immediately once the criteria have been met. Meaningful evidential documents must be attached to the request. The Examination Office will immediately communicate the result to the candidate and to the Examination Board, along with any newly set exam dates. The working period for a Master Thesis cannot be extended by such default periods. The task set will be regarded as not allocated. At the end of the default period, the candidate will be given a new topic.

(8) In the case of any multiple or otherwise serious deception attempts, the candidate may be exmatriculated. A decision with regard to this will be made by the Dean upon suggestion by the Examination Board.

(9) Any intentional violation of a regulation of these examination rules with regard to deception in relation to exam results will be regarded as an offence. Such an offence may be punished by a fine of up to 50,000 Euros. The responsible administration authority for prosecuting and punishing such offences according to sentence 1 is the Chancellor of Bonn University.

§ 14 Written Papers

(1) Written exam papers are intended to provide a means for students to prove that they are able to find an approach to a solution to a problem from the subject area of the module within a limited period of time and with limited aids by using methods customary in this particular area. The examiners will announce the admissible aids in good time.

(2) The time allowed for the completion of each written paper will be no less than 90 minutes and no more than 180 minutes. The paper will be evaluated at the first test date by one examiner and at the second test date by two examiners. The mark given for the paper will be made up from the arithmetic mean of the individual marks. The result will be communicated to the candidate after no more than six weeks.

(3) Candidates have the right to apply for permission to view their marked written papers. Such an application must be filed no later than three months after the communication of the examination result. The Examination Board will communicate to the candidate in good time the period of time for viewing.

(4) Instead of the scheduled written paper, the Examination Board may set, in agreement with the examiner, an oral exam which will cover the subject area of the module. This will be made known in good time at the beginning of the semester on a notice board or in electronic form.

§ 15 Oral Examinations

(1) Oral exams are intended to give candidates the opportunity to prove that they have acquired a broad knowledge base in the examination subject, that they recognise the relationships thereof and are able to correlate special problems with these relationships and to demonstrate possibilities for their solution.

(2) Oral exams will be taken as individual or group exams either before several examiners (Examining Board) or before one examiner in the presence of a competent assessor. A deviation from this is possible, provided the auditability of the examination is ensured. If the examination takes place before several examiners, the candidate will be examined in each examination area by only one examiner. Prior to fixing the mark, the examiner is obliged to consult the other examiners or assessors without the candidate present. The examination time for each candidate and module exam will be no less than 15 and no more than 45 minutes. In the case of group exams, each candidate within each group must be given the same exam time proportion.

(3) The essential items and the result of the individual exams shall be minuted. The result shall be communicated to the candidates at the end of the oral exam.

(4) Where space permits, any candidates wanting to sit the same oral exam at a later date will be admitted as onlookers, provided that all the candidates agree. The decision will be made by the examiner or, if the examination is held by a Board, by the Chairman of this Board. Admission does not extend to the consultation and communication of the exam results. Onlookers are not allowed to take notes during the exams.

(5) Instead of the scheduled oral exam, the Examination Board may set a written exam paper upon agreement with the examiner, which covers the subject area of the module. This will be communicated in good time at the beginning of the semester on the notice board or in electronic form.

§ 16 Projects, Presentations and Seminar Lectures

(1) Projects are used, as a rule, to allow students to demonstrate their team working ability and in particular their ability to develop, implement and present concepts. Candidates shall demonstrate that they are able to define objectives within a larger task and to find interdisciplinary solution approaches and concepts. In the case of a project completed as a team, the contribution of each individual candidate needs to be clearly recognisable and evaluatable, and the requirements according to sentence 1 must be met. § 15 applies correspondingly to the presentation of projects.

(2) Presentations are oral discourses of no less than 10 and no more than 45 minutes' duration. They document the candidates' ability to present their own results arrived at by scientific methods in a comprehensible manner and to explain them in a discussion. Apart from that, § 15 applies correspondingly.

(3) Seminar lectures are oral discourses of no less than 15 and no more than 60 minutes' duration. They are supported by scientific original literature and candidates' own research work and will, as a rule, be complemented by a written paper of 5-10 DIN A4 pages. Seminar discourses document the candidates' ability to present scientific results in a comprehensible manner and to explain them in a discussion. § 14 applies to the written paper, § 15 correspondingly to the discourse.

§ 17 Master Thesis

(1) The Master Thesis is a written examination paper intended to show that the candidate is able to work on a problem from the subject area of the course of studies independently using scientific methods within a specified term, to find a solution therefore and to present this in an appropriate manner. When enrolling for the Master Thesis, the candidate shall be given the opportunity to present suggestions for the subject area from which the topic of the Master Thesis is selected; however, the Examination Board is not bound to take up this suggestion. The Master Thesis shall be written in English.

(2) The topic of the Master Thesis may be set by any of the examiners appointed according to § 7, par. 1. The person who sets the topic will, as a rule, also be the supervisor for this Master Thesis. If the Master Thesis is to be set and supervised by another university lecturer active in research and teaching or is to be carried out in a facility outside of the university, this will require the approval of the Chairman of the Examination Board, which may be given only if appropriate support by the examiner according to § 7. par. 1 is ensured.

(3) The Chairman of the Examination Board will ensure, upon the candidate's application, that he/she is given their topic for the Master Thesis in good time.

(4) The topic of the Master Thesis will be issued via the Examination Board. The topic of the Thesis and the time of issue will be put on record.

(5) The Master Thesis may be permitted to take the form of group work, provided the contribution of each individual candidate whose examination performance is to be evaluated can be clearly identified and evaluated by marked sections, page numbers or other objective criteria enabling an unambiguous identification, and provided the requirements regarding par. 1 are met. The textual part of the Master Thesis shall comprise no less than 25 and no more than 100 DIN A4 pages; in the case of group work, the overall scope will be increased accordingly, the proportion of each candidate in the group work should then be at least 25 pages.

(6) The overall amount of work required to complete the Master Thesis is approximately 900 hours and thus corresponds to 30 ECTS-POINTS. The time period for carrying out the work will be a maximum of six months. Topic, task and scope of the Master Thesis shall be limited in such a way that the Master Thesis can be completed within this period under reasonable requirements. The

Chairman of the Examination Board can, on a substantiated application, grant an extension of term of up to six weeks in agreement with the thesis supervisor. The Master Thesis will, as a rule, be issued at the end of the third semester. The topic of the Thesis may be rejected by the candidate only once and only within the first two months after it was issued. If the topic is refused under these circumstances, the Master Thesis will be deemed as not issued.

(7) When submitting the Master Thesis, the candidate has to confirm in writing that the Thesis – in the case of group work the correspondingly marked part of the Thesis – was written independently and that none other than the specified sources and aids were used and that any citations have been marked. The Examination Office may, where there is any doubt, demand from the candidate an affidavit with regard to this as well as a version of the Master Thesis which allows an electronic match to be made (diskette, CD ROM etc.).

§ 18 Acceptance, Evaluation and Retaking of the Master Thesis

(1) The Master Thesis shall be handed in to the Examination Board, by the deadline, in triplicate; the time of submission will be put on record. Once handed in, a Master Thesis can no longer be withdrawn by the candidate. If the Master Thesis is not handed in by the deadline, it will be evaluated as “nicht ausreichend” (5.0) (inadequate).

(2) The Master Thesis shall be assessed and evaluated by two examiners appointed according to § 7, par. 1. One of these examiners will be the one who set the topic of the Master Thesis; the second examiner will be appointed by the Examination Board from the group of examiners named in accordance with § 7, par. 1. At least one of the examiners must be a member of the group of university lecturers at Bonn University. Candidates may make suggestions; however, they have no right to demand that a certain examiner be allocated to them.

(3) The individual evaluations will be carried out in accordance with § 19, par. 1 and will be substantiated in writing. The mark of the Master Thesis will be made up of the arithmetic mean of the individual evaluations, provided the difference is less than 2.0. If the difference is 2.0 or more, the Examination Board will appoint a third examiner to mark the Master Thesis. In this case, the mark will be made up of the arithmetic mean of the two better individual marks. For calculating the mean value, § 19, par. 6 applies. The Master Thesis, however, may be evaluated as “ausreichend” (adequate) or better only if at least two marks are “ausreichend” or better.

(4) The evaluation of the Master Thesis will be communicated to the candidate no later than eight weeks after the closing date. If the Master Thesis was completed by several students working as a team, the independent proportion of each individual student within the group shall be evaluated.

(5) If the Master Thesis is marked “ausreichend” (4.0) or better, the candidate will obtain 30 ECTS-points.

(6) If the Master Thesis is evaluated as “nicht bestanden” (failed) or is regarded as “nicht bestanden”, the candidate may re-take it once. Any failed attempts in the same subject area at other universities will be taken into account. The topic of the second Master Thesis does not have to be selected from the same subject area from which the topic for the first Master Thesis was taken. The topic of the re-taken Master Thesis may, however, be refused in accordance with § 17, par. 6, sentence 6 only if the student did not make use of this option in their first Master Thesis. If this second Master Thesis is also evaluated as “nicht ausreichend” (inadequate), the Masters examination is regarded as finally failed.

§ 19 Evaluation of Examination Results, Working Out of Marks and Passing the Masters Exam

(1) The marks for the individual exam results will be set by the respective examiners. If several examiners are involved in the examination, the mark will be made up by the arithmetic mean value of the individual marks. The following marks will be used for the evaluation:

1	sehr gut (very good)	an outstanding performance
2	gut (good)	a performance which substantially exceeds the average requirements
3	befriedigend (satisfactory)	a performance corresponding to the average requirements
4	ausreichend (adequate)	a performance meeting the requirements despite its deficiencies
5	nicht ausreichend (inadequate)	a performance which due to its major deficiencies no longer meets the requirements

For a differentiated evaluation of the examination results, individual marks may be raised or lowered to interim values by 0.3. The marks 0.7 and 4.3 as well as 4.7 and 5.3 are excluded from this.

(2) An exam in a module is passed if the module mark is at least “ausreichend” (4.0). Where the module mark is made up of several partial exam results, it will be calculated from the weighted arithmetic averages of the marks of the individual exam results. The module mark to be shown in the report is as follows:

average up to and including 1.5	= sehr gut (very good)
average from 1.6 up to and including 2.5	= gut (good)
average from 2.6 up to and including 3.5	= befriedigend (satisfactory)
average from 3.6 up to and including 4.0	= ausreichend (adequate)
average from 4.1 upwards	= nicht ausreichend (inadequate)

(3) The evaluation of the written exam performances shall be communicated to the candidate no later than six weeks, and the evaluation of the Master Thesis no later than eight weeks after the closing date. A communication on the notice board or in electronic form – in accordance with the requirements stipulated in the Data Protection Act – is adequate. This will take place prior to the end of the set period of time for completion of studies.

(4) The Masters examination is regarded as passed if all module exams as well as the Master Thesis have been passed with at least “ausreichend” (adequate) (4.0) and 120 ECTS-points have been obtained under consideration of §§ 4 and 8, par. 7.

(5) The overall mark of the Masters examination is calculated from the average (arithmetic mean) of the individual module marks, weighted by the score points of the respective module marks. Para 2, sentence 3 applies accordingly. Deviating therefrom, the overall mark will be “ausgezeichnet” (outstanding), if the average mark of all module exams is no worse than 1.3 and the Master Thesis was marked 1.0. Any modules recognised as “bestanden” (passed) due to lack of comparability will not be taken into account in the calculation of the overall mark.

(6) When making up the module marks and the overall mark, only the first digit after the decimal point will be taken into account; any further digits will be deleted without rounding up or down.

(7) In order to facilitate international comparability, the overall mark will have allocated thereto the corresponding level of the European Credit Transfer and Accumulation System (ECTS).

(8) The Masters examination will be regarded as finally failed if

- the candidate has made three unsuccessful attempts at the module exam and the compensation options in the obligatory optional area according to § 12, par. 3 have been exhausted, or if
- the re-sat Master Thesis was marked “nicht ausreichend” (inadequate).

§ 20 Report

(1) As soon as all the final marks are available, a preliminary confirmation of the exam results will be sent to the candidates. Subsequently - if possible within four weeks - a report will be issued in the German language, which will have attached thereto an English translation certified by the Examination Office. The report will include:

- all the modules from which score points have been obtained,
- the semester in which the score points were obtained,
- the marks of the individual exam performances which were achieved,
- the topic of and mark attained in the Master Thesis, as well as
- the overall mark attained in the Masters exam and the corresponding ECTS level.

(2) Upon the candidate’s application, results of exams in any additional subjects or modules may be included in the report in accordance with § 25, together with the corresponding scope of studies.

(3) The report will bear the date on which the last exam result was achieved. It will stamped with the seal of the Examination Office and will be signed by the Dean and the Chairman of the Examination Board.

(4) If the Masters examination has been finally failed or is regarded as finally failed, the Examination Office will communicate this to the candidate in writing, indicating any available legal remedies.

(5) Students leaving the university without a final degree may, after exmatriculation, apply for a performance report listing the overall study and exam performances achieved. This performance report will be limited to any successfully completed parts of the course of study. In addition, a confirmation may be issued, upon the student’s request, which additionally indicates which examinations were not passed or which are still missing in order to pass the Masters examination.

§ 21 Diploma Supplement

The Masters report will be supplemented by a Diploma Supplement. The Diploma Supplement will include, in a standardised English language form, any complementary information regarding study content, study process, plus the academic and occupational qualifications obtained with the final degree, as well as details about the issuing university.

§ 22 Masters Certificate

Together with the Masters examination report, the students will be handed a Masters Certificate which bears the date of the report in the German language on the conferral of the academic degree according to § 2. The certificate will be signed by the Dean of the Faculty and by the Chairman of the Examination Board and will bear the seal of the Faculty of Mathematics and Natural Science.

§ 23 Viewing the Examination Files

- (1) Within a period of six months after receiving the examination report, students may apply to the Examination Board for permission to view their examination files.
- (2) The Examination Board will determine the location and time of the viewing. Copying or removing any parts of the examination file is not permitted.

§ 24 Invalidity of the Masters Exam, Withdrawal of the Masters Degree

- (1) If a student is found guilty of deception during an exam after the report has been issued, the Examination Office may change retrospectively any marks for those exams during which the deception took place as well as the overall mark proportionately and may declare the exam wholly or partially as “nicht bestanden” (failed).
- (2) If the conditions for admission to an exam were not met, without there being any intentional deception on the part of the candidate, and this fact does not become known until after the issuing of the report, then this deficiency will be remedied by the exam having been passed. If a candidate has deliberately brought about their admission, the Examination Office will decide the legal consequences on the basis of the *Verwaltungsverfahrensgesetz* (Administrative Procedures Act) for the Federal State of Nordrhein-Westfalen.
- (3) Prior to a decision being made, the individuals concerned will be given an opportunity to be heard.
- (4) The incorrect examination report will be withdrawn and, if applicable, a new examination report will be issued. In addition to the incorrect exam report, the Masters Certificate will also be withdrawn if, because of a deception, any of the exams have been declared “nicht bestanden” (failed). A decision according to par. 1 and par. 2, sentence 2, will be no longer possible after a period of five years after the exam report was issued.
- (5) If the Masters exam is overall declared “nicht bestanden” (failed), the student will be stripped of their Masters Degree, with both the Masters Report and the Masters Certificate also being withdrawn.

§ 25 Additional Examination Performances

Provided not all of the examinations mentioned in § 9, par. 2 have been sat, students may apply to sit examinations in additional modules of this course of studies, which are not part of the study programme of the course of studies, but are recognised as an examination subject at a Faculty (additional subjects or modules). The result of the examinations in these additional subjects or modules will be included in the report upon the student’s request, but will not be taken into account when determining the overall mark.

§ 26 Coming into Effect and Publication

The present examination rules will become effective upon their publication in the *Amtliche Bekanntmachungen* (Official Communications) of the Rheinische Friedrich-Wilhelms University Bonn - *Verkündungsblatt* (Communications Bulletin).

All students enrolled in the Master Degree Course Computer Science at the Rheinische-Friedrich-Wilhelms-Universität Bonn at the time of the coming into effect of this statute who have not yet successfully completed the Masters examination, will be subject to the following modification: all

ECTS-points obtained so far will be raised from 4 to 6 and, respectively, from 8 to 9 as long as the relevant modules are displayed with the higher ECTS-points in the new module plan. Modules, the scope of which has been reduced from 4+2 SWS to 2+2 SWS in the new module plan, will be assigned 9 instead of 6 ECTS-points in the course of the adjustment.

The Dean
of the Faculty of Mathematics and Natural Science
of the Rheinische Friedrich-Wilhelms-Universität Bonn
University Professor Dr Armin B. Cremers

drawn up as a result of the decision of the Faculty Council dated 27th June 2007 as well as the Rectorate's resolution dated <Datum>.

Bonn, on the

The Rector
of the Rheinische Friedrich-Wilhelms-Universität Bonn
University Professor Dr. Matthias Winiger

Annex 1

Rules for the Examination to Establish the Special Course-Related Suitability according to § 3 of the Masters Examination Rules in Computer Science (Ma-PO)

I. General Principles

(1) In accordance with the admission conditions listed in § 3, par. 1 of the Ma-PO, admission to the Masters Course in Computer Science requires, amongst other things, proof of special study-related suitability.

(2) The proof of special study-related suitability will be established, according to these rules, via a special procedure (suitability determination procedure).

(3) The aim of the procedure is to establish whether an applicant for a university place possesses special study-related abilities which allow a successful completion of the course of studies to be expected.

(4) §§ 6 (Examination Office and Examination Board), 7 (Examiners and Assessors), 8 (Recognition of Study and Examination Performances), 23 (Viewing of the Examination Files) and 24 (Invalidity of the Masters Exam, Withdrawal of the Masters Degree) Ma-PO apply accordingly.

II. Application Eligibility and Procedure / Admission to a Process for the Determination of Suitability

(1) Applicants meeting the other admission criteria listed in § 3, par. 1 of Ma-PO or expected to meet the criteria according to par. 5, sentence 2 are eligible to take part in a process for determining the special study-related suitability.

(2) Applications for admission to the suitability determination procedure must be filed using the application form provided by the Examination Board. Admission will be for the summer or the winter semester. The deadline for applications is on 1st January and 1st July, respectively. The receipt stamp of Bonn University determines whether the application has been filed on time. The application date and the decisions according to Section VI will be coordinated with the enrolment date.

(3) Copies of the following documents must be attached to the application:

- a) proof of the formal qualification according to § 3, par. 1, No. 1 Ma-PO,
- b) a completed application form for a place at the university,
- c) a CV including details of education received to date,
- d) proof of knowledge of the English language according to § 3, par. 1, No. 2 Ma-PO.

(4) Decisions about applications for admission to the suitability determination procedure will be taken by the Chairman of the Examination Board formed in accordance with § 6 Ma-PO.

(5) Admission will be denied if the application is incomplete. If any documents according to par. 3 a) are not yet available at the time of application, a corresponding confirmation of the respective university as well as a list of the modules passed, along with the marks achieved, will be sufficient for the application. Formal proof must be handed in by the applicant immediately upon receipt.

III. Implementation of the Suitability Determination Procedure

(1) The Examination Board formed according to § 6 MA-PO is responsible for the organisation of the conduction of the suitability determination procedure. The Examination Board will advise and decide in a non-public session. It will appoint a committee to implement the procedure. This will

consist of a Chairman and three additional members from the group of university lecturers in the area of computer science. Any decisions will be made by a simple majority. In the case of a tie, the Chairman will have the casting vote.

(2) The Examination Board will appoint the examiners for the suitability determination procedure. § 7 of the Ma-PO will apply accordingly.

IV. Suitability Determination Procedure

(1) The level of education that has been achieved in the subject of computer science will be determined on the basis of the application documents. In particular the procedure will check whether the applicant possesses the knowledge required for a successful completion of the Masters Course of Computer Science in the areas listed below:

- mathematical foundations for computer science;
- foundations in theoretical computer science;
- foundations in programming, software technology and information systems;
- foundations in technical and system-near computer science.

The standard used will be the level of knowledge that is achieved in a Bachelors Course in Computer Sciences at Bonn University at the end of the 5th course semester. The committee appointed by the Examination Board will decide whether a suitability determination test has to be carried out in order to classify the applicant's qualification in accordance with the above-mentioned criteria.

(2) Any applicants who have completed the Bachelor Course in Computer Sciences at Bonn University with an overall mark of 2.5 or better have thereby proved their suitability and are exempt from a suitability determination test.

(3) The duration of the written examination will be no more than three hours. The duration of the oral exam will be no more than one hour. The form of exam plus the date of the test will be communicated in writing to applicants meeting the admission criteria for the suitability determination procedure according to section II. The language for the examination will be English.

(4) § 11, par. 6 Ma-PO applies analogously.

V. Evaluation of Examination Performance in the Suitability Determination Procedure

(1) The performances achieved in the written paper or in the oral exam will be evaluated using score points. The highest score will be 100 points. The suitability determination test will be considered as passed if at least 50 points are scored.

(2) If an applicant tries to influence the test result by deception or by the use of inadmissible aids, the test will be evaluated with an overall result of 0 points. In the event that such deception is determined by the invigilator according to sentence 1, the applicant has the right to demand that the decision be reviewed by the Examination Board.

(3) The written paper will be evaluated by two examiners. Examination performance will be evaluated by the two examiners separately using the points system. The overall evaluation of the examination performance will be calculated from the arithmetic averages of the individual evaluations of the two examiners.

(4) The oral test will be taken either in front of several examiners or in front of one examiner in the presence of a competent assessor (§ 7, par. 1 Ma-PO) in an individual or a group conversation. During group tests, each candidate in a group must be given the same proportion of test time. In the case of a test by one examiner, the examiner is obliged to consult the assessor prior to determining the result without the applicant being present.

VI. Communication of the Result and Re-taking the Suitability Determination Test

(1) The result of the suitability determination test will be communicated to the applicant in writing by the Examination Board. A negative decision must be accompanied by information on possible legal remedies. This must include the reasons for the negative decision. In the case of an oral examination, the candidate shall be told the result immediately after the test as well.

(2) Any applicants who have been unsuccessful in the suitability determination test may re-sit the suitability determination test at the date of the following semester at the earliest. A second re-sit is not possible; this would require a renewed application.

VII. Individuals Changing their Place of Study

In the case of individuals changing their place of study, who have already enrolled for a Masters Course in Computer Science or a comparable course of studies at another university, the Examination Board will check the individual qualification, including any suitability determination tests which have already been sat successfully. If the Examination Board establishes the equivalence of the courses of study and the suitability determination test, the applicant may be exempt from having to sit another suitability determination test at Bonn University.

Annex 2: Module Plan for the Masters Course in Computer Science

(V = Lecture, Ü = Exercise, S = Seminar, P = Practical Training)

Emphasis “Algorithmics”

Module	Course Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINT
MA-INF 1101 Pearls of Algorithms	1 st Sem.	none	1 Semester	successful participation in exercises	oral	V4 + Ü2	9
MA-INF 1102 Combinatorial Optimisation	1 st or 2 nd Sem.	none	1 Semester	successful participation in exercises	oral	V4 + Ü2	9
MA INF 1201 Approximation Algorithms for NP-Hard Problems	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 1202 Chip Design	1 st or 2 nd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 1203 Discrete and Computational Geometry	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 1204 Seminar Selected Topics in Information and Learning Theory	2 nd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 1205 Graduate Seminar Discrete Optimisation	2 nd Sem.	MA-INF 1102	1 Semester	regular attendance, paper	discourse	S2	6
MA-INF 1206 Seminar Design and Analysis of Randomised and Approximation Algorithms	2 nd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 1207 Practical Training in Combinatorial Algorithms	2. Sem.	MA-INF 1102	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P2	9

Module	Course Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINTS
MA-INF 1208 Cryptography	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 1301 Algorithmic Game Theory And the Internet	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 1302 Advanced Topics in Algorithmics	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 1303 Selected Topics in Algorithmics	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 1304 Seminar Geometric Distance Problems	3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 1305 Graduate Seminar Chip Design	3 rd Sem.	MA-INF 1102 or MA-INF 1202	1 Semester	regular attendance	discourse	S2	6
MA-INF 1306 Seminar Combinatorial and Geometric Optimisation	3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 1307 Seminar Advanced Algorithms	3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 1308 Praktikum Algorithms for Chip Design	3 rd Sem.	at least three of the modules MA-INF 1102, MA-INF 1202, MA-INF 1205, MA-INF 1207	1 Semester	regular participation, software documen- tation	Discourse incl. software presentation	P2	9
MA-INF 1309 Practical Training in Efficient Algorithms for Selected Prob- lems: Design, Analysis, and Implementation	2 nd and 3 rd Sem.	none	1 Semester	regular attendance, software documenta- tion	Discourse incl. software presentation	P2	9

Emphasis “Graphics, Vision and Audio”

Module	Semester	Participation Conditions	Duration	Study requirements for participating in an Exam	Form of Exam	SWS	EC TS-POINT
MA-INF 2101 Foundations of Graphics, Vision, and Audio	1 st or 2 nd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 2111 Foundations of Graphics	1 st or 2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 2112 Foundations of Vision and Audio	1 st or 2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 2201 Computer Vision	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 2202 Computer Animation	2 nd Sem.	MA-INF 2101	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 2203 Selected Topics in Signal Processing	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 2204 Rendering Techniques I	2 nd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 2205 Geometry Processing I	2 nd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 2206 Seminar Vision	2 nd and 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 2207 Seminar Graphics	2 nd and 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 2208 Seminar Audio	2 nd and 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 2301 Advanced Topics in Computer Vision	3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 2302 Physics-based Modelling	3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINTS
MA-INF 2303 Selected Topics in Multimedia Retrieval	2 st or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 2304 Rendering Techniques II	3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 2305 Geometry Processing II	3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 2306 Virtual Reality	3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	4
MA-INF 2307 Practical Training in Vision	3 rd Sem.	none	1 Semester	regular attendance, paper	Discourse incl. software presentation	P2	9
MA-INF 2308 Practical Training in Graphics	3 rd Sem.	none	1 Semester	regular attendance, paper	Discourse incl. software presentation	P2	9
MA-INF 2309 Practical Training in Audio	3 rd Sem.	none	1 Semester	regular attendance, paper	Discourse incl. software presentation	P2	9

Emphasis “Information and Communication Management”

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINTS
MA-INF 3101 High Performance Networking	1 st - 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINTS
MA-INF 3102 Information Systems Engineering	1 st - 3 rd Sem.	none	1 Semester	successful participation in exercises	Oral	V4 + Ü2	9
MA-INF 3201 Network Security	2 nd o. 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 3202 Mobile Communication	2 nd o. 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 3203 Intelligent Information Systems	2 nd o. 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 3204 Distributed and Mobile Information Systems	2 nd o. 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 3205 Internet Information Systems	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 3206 Aspect-oriented Software Development	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 3207 Advanced Logic Programming	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 3208 Model Driven Engineering	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 3209 Seminar Selected Topics in Communication Management	2 nd o. 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 3210 Seminar Selected Topics in Intelligent Information Systems	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 3211 Seminar Selected Topics in Sensor Network Research	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINTS
MA-INF 3212 Advanced Topics in Software Construction	1 st – 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 3213 Advanced Topics in Information Systems	1 st – 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 3214 Selected Topics in Information Management	1 st – 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 3301 Spatial Information Systems	3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 3302 Temporal Information Systems	2 nd o. 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 3303 Seminar Enterprise Software Engineering	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 3304 Practical Training in Communication and Communication Devices	2 nd and/or 3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P4	9
MA-INF 3305 Practical Training in Information Systems	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P4	9
MA-INF 3306 Practical Training in Enterprise Software Engineering	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P6	9
MA-INF 3307 Sensor Networks	3 rd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü1	4
MA-INF 3308 Seminar Selected Topics in Pervasive Computing	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, software documentation	discourse	S2	4

Emphasis “Intelligent Systems”

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINT
MA-INF 4101 Theory of Sensorimotor Systems	1 st or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 4102 Intelligent Learning and Analysis Systems	1 st or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V4 + Ü2	9
MA-INF 4201 Artificial Life	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4202 Computational Neuroscience and Neural Computation	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4203 Autonomous Mobile Systems	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4204 Technical Neural Nets	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4205 Probabilistic Graphical Models	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4206 Knowledge-based Image Understanding	2 nd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4207 Dynamically Reconfigurable Systems	2 nd Sem.	none	1 Semester	successful participation in exercises	oral	V2 + Ü2	6
MA-INF 4208 Seminar Biological and Technical Neural Computation	2 nd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 4209 Seminar Principles of Data Mining and Learning Algorithms	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4
MA-INF 4210 Seminar Advanced Topics in Technical Informatics	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, paper	discourse	S2	4

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-POINT
MA-INF 4301 Advanced Topics in Artificial Intelligence	3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4302 Advanced Learning Systems	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4303 Learning from Non-Standard Data	2 nd or 3 rd Sem.	none	1 Semester	successful participation in exercises	written	V2 + Ü2	6
MA-INF 4304 Practical Training in Development and Physical Realisation of Sensory and Motor Modules	3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P4	9
MA-INF 4305 Practical Training in Autonomous Robots	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P4	9
MA-INF 4306 Practical Training in Development and Application of Data Mining and Learning Systems	3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P2	9
MA-INF 4307 Practical Training in Field Programmable Gate Arrays	2 nd or 3 rd Sem.	none	1 Semester	regular attendance, software documentation	Discourse incl. software presentation	P4	9

Master Thesis

Module	Semester	Participation Conditions	Duration	Study Requirements for Participating in an Exam	Form of Exam	SWS	EC TS-
MA-INF 0401 Master Thesis	4 th Sem.	none	1 Semester	none	Master Thesis (written)		30
MA-INF 0402 Accompanying Seminar for Masters Thesis	4 th Sem.	none	1 Semester	regular attendance	discourse with presentation of the results of the Masters Thesis		2

The Dean may allow further obligatory optional modules upon the suggestion of the Examination Board. The Examination Office will announce the approved obligatory optional modules at the beginning of the semester on the notice board or electronically.