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HEIDELBERG UNIVERSITY EXAMINATION AND DEGREE PROGRAMME RULES AND REGULATIONS FOR THE MASTER'S DEGREE PROGRAMME IN COMPUTER ENGINEERING

Date: 11 July 2011

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Preamble:

All official, job, status or function titles in this document are used in the masculine form, however they refer to men and women alike and can also be used in the corresponding feminine form.

I. General information**§ 1 Purpose of the academic programme and Master's degree**

- (1) The consecutive, research-oriented Master's degree programme in Computer Engineering conveys in-depth specialist knowledge and an understanding of the scientific methods employed in computer engineering as well as (to a limited extent and according to the interests of the student) in additional subject areas.
- (2) Heidelberg University, represented by the Faculty of Physics and Astronomy, awards the academic degree of "Master of Science" (M.Sc.) to candidates who have passed the Master's examination.
- (3) The Master's degree certifies that students have an overview of the interconnections between the individual disciplines, are able to apply scientific and academic methods and knowledge, and have acquired the specialist knowledge necessary to enter into a profession or a doctorate programme.

§ 2 Standard period of study, programme structure and range of courses offered

- (1) Standard course duration is four semesters.
- (2) Studying in a part-time degree programme, as defined by Heidelberg University's part-time degree programme rules and regulations, is possible.
- (3) If the Master's examination has not been passed within two academic semesters following the end of the standard period of study, the student must justify the reasons to the examinations board or risk losing his entitlement to take the final examination three academic semesters after the end of the standard period of study, unless the student is not responsible for exceeding the deadline. After assessment of the reasons, the examinations board may set a new deadline for completion of the examination. If this deadline is not met, the student loses his entitlement to take the final examination, unless he is not responsible for exceeding the deadline. In exceptional and justifiable cases, the examinations board may extend the deadline repeatedly.
- (4) Examination prerequisites are graded using credits in accordance with the European Credit Transfer System. One credit point corresponds to a workload of 30 hours. Credits are only awarded for successfully completed modules (see §11, Section 4).
- (5) The range of courses is divided into the areas listed in Attachment 1. It includes the modules listed in the module handbook that are assigned to one or numerous areas. The module handbook lists multiple options for the 'specialisation' area. In

total, 120 credits are required, which is the equivalent of 30 credits per semester.

- (6) Generally, the language of instruction and examinations is German. Classes may be given and examinations taken partially or completely in English.
- (7) A transcript of records will be issued at the end of each semester listing all passed module examinations as well as corresponding credits and grades.

§ 3 Admission to the academic programme

Admission to the academic programme is subject to separate admissions regulations.

§ 4 Recognition of study periods, examination prerequisites and examination results

- (1) Completed examination prerequisites and results obtained at a domestic or foreign university or comparable institution are recognised provided that there is no significant difference in terms of acquired skills as defined by the module handbook.
- (2) When recognising periods of study, as well as completed examination prerequisites and results obtained outside the Federal Republic of Germany, equivalency agreements and agreements between partner universities approved by the Conference of German Ministers of Education (Kultusministerkonferenz, KMK) and German Rectors' Conference (Hochschulrektorenkonferenz, HRK) must be taken into account.
- (3) Section 1 applies in the case of study periods, completed examination prerequisites and results obtained at state-recognised distance learning institutions and other institutes of education, in particular universities of cooperative education (state or state-recognised).
- (4) If examination prerequisites and results are recognised, grades - insofar as grading systems are similar - must be transferred and included in the calculation of the overall grade in accordance with these examination rules and regulations. If grading systems are not comparable, examination prerequisites and results are graded as a "pass". This recognition can be indicated in the diploma. If more than 50 % of the examination components to be recognised are ungraded examination components completed during the course of study or examination components completed during the course of study using grading systems that are not comparable, the examinations board has to make the final decision.
- (5) Relevant professional experience may be recognised.
- (6) Qualifications not gained in university degree programmes are recognised according to § 32 of the Act on Higher Education of the Land of Baden-Württemberg (LHG) provided that they adequately replace skills as defined in the module handbook.
- (7) Decisions are made by the examinations board in accordance with Sections 1 to 6.

II. Examinations board, examinations, grades

§ 5 Examinations board

- (1) The examinations board organises examinations and tasks defined in these examination rules and regulations. The examinations board ensures that the examination rules and regulations are upheld.
- (2) It consists of three professors or lecturers, a representative of the research assistants as well as a student with advisory authority.
- (3) The faculty appoints the chairperson, his deputy, the other members of the examinations board and their respective deputies. The chairperson and the deputy must be university professors and/or lecturers. The examinations board student representative is appointed by the faculty council based on a proposal from the departmental student committee.
- (4) The members are generally appointed for three years; the student member is appointed for one year. Each term begins on 01 October. Members may be re-elected.
- (5) The chairperson manages the business of the examinations board, prepares and chairs meetings and, in the event of a tie vote, has the deciding vote. Further examinations board tasks can be assigned to the chairperson, provided this does not violate applicable law. This decision may be revoked at any time.
- (6) Upon request, the examinations board reports to the faculty regarding changes to examinations, study periods and grading.
- (7) The examinations board monitors the operations of the degree programme and makes suggestions related to development of the curriculum and the examination rules and regulations.
- (8) Examinations board members have the right to attend examinations.
- (9) Members of the examinations board and their deputies are subject to official secrecy. Those who are not civil servants are sworn to secrecy by the chairperson.
- (10) The candidate must be informed of negative decisions immediately and in writing, stating the reasons and providing information on the legal appeals procedure.

§ 6 Examiners and observers

- (1) In general, examination components which are not completed during the course of study may only be examined by professors or lecturers, associate professors or lecturers as well as research associates who have been granted examination rights.
- (2) Following consultation with the examinations board, the chairperson appoints the examiners and observers for all examination components.
- (3) In general, the lecturer for the respective lecture or course is responsible for examination components completed during the course of study.
- (4) Observers must have taken the Master's examination or at least an equivalent final examination.
- (5) For examiners and observers, § 5 Section 9 (official secrecy) shall apply accordingly.

§ 7 Unexcused absences, withdrawal, deception and breaches of regulations

- (1) An examination is considered "failed" (5.0) if candidates fail to appear to the examination without a valid reason for their absence, or if they withdraw after the examination has started. A written examination that was not concluded within the allocated time is also assigned a "failing grade", unless the candidate is not responsible for exceeding the deadline.
- (2) Reasons for withdrawal or absence must be stated credibly and immediately to the examinations board in writing. If the candidate, or a child for whom the candidate is generally solely responsible, is ill, a medical certificate must be provided; in case of doubt, a medical certificate from a doctor, designated by the university, may be requested. If the reasons are accepted, a new examination will be scheduled. In this case, examination results that are already available will be taken into account.
- (3) When deciding whether the candidate is responsible for exceeding a registration or examination deadline, the examinations board must respect the provisions stated in the legislation on maternity leave and the legal regulations concerning parental leave.
- (4) If the candidate tries to influence the examination results by means of deception or by using unauthorised aids, the examination component in question will be graded as "failed" (5.0). If candidates disrupt the proper course of the examination, they may be excluded from further taking part in the examination by the examiner or examination supervisor. In this case, the examination result will be graded as "failed" (5.0). In severe cases, the examinations board may exclude the candidate from all further examinations.
- (5) The candidate may request a review of the decision by the examinations board in accordance with Section 4 Sentences 1 and 2 within a period of fourteen days.

§ 8 Types of examination components

- (1) The examination components are:
 1. oral examination components completed during the course of study
 2. written examination components completed during the course of study (electronically where applicable)
 3. the research project
 4. the Master's thesis
- (2) If candidates provide a medical certificate which credibly proves that they are not able to take examination components completely or partially in their intended form, due to long-term or permanent health problems, the examinations board may allow them to take an equivalent examination. The same applies for examination prerequisites.
- (3) Module examinations may consist of several sub-module examinations.

§ 9 Oral examination components completed during the course of study

- (1) In oral examination components, candidates are required to demonstrate their technical knowledge and show that they are able to identify interconnections within the subject of the examination and relate specific problems to these interconnections.

- (2) An oral examination may last between 15 and 60 minutes.
- (3) Generally, oral examination components related to a lecture are examined by an examiner as well as an observer, who is responsible for recording the most significant topics in the minutes.
- (4) An observer is not required in the case of presentations given in seminars.
- (5) Candidates must be notified of examination results following the oral examination.

§ 10 Written examination components completed during the course of study

- (1) In written examination components, candidates are required to prove that they are able to recognise problems relating to their subject and find solutions for them, using subject-specific methods with limited time and resources.
- (2) A written examination may last between 45 and 180 minutes.

§ 11 Assessment of examination components

- (1) Grades for the individual examination components are determined by the respective examiners. The following grades must be used for assessment of examinations:

1 = very good	: an outstanding performance
2 = good	: a performance which is substantially better than average requirements,
3 = satisfactory	: a performance which corresponds to average requirements,
4 = sufficient	: a performance which, despite deficiencies, still meets the requirements,
5 = failed	: a performance which does not meet the requirements due to considerable deficiencies.

For a more detailed assessment of examination results, interim grades may be applied by increasing or decreasing the individual grades by 0.3; the grades 0.7, 4.3, 4.7 and 5.3 may not be applied.

- (2) When calculating the overall grade, only the first decimal after the point is taken into account. The other decimals are dropped without rounding.
- (3) The grades are:

- 1.0 ... 1.5	: very good
- 1.6 ... 2.5	: good
- 2.6 ... 3.5	: satisfactory
- 3.6 ... 4.0	: sufficient
- 5.0	: failed
- (4) Students receive a passing grade in an examination component if it has been graded as "sufficient" (4.0) or higher.
- (5) The module grade is calculated as the mean of all partial module examination grades. The partial grades are weighted according to the scope of the sub-module (in credits).

- (6) Individual modules may not require a grade. In these cases students can merely "pass" or "fail" the module. The modules in question are identified accordingly in the module handbook.
- (7) ECTS grades, according to the European Credit Transfer System, are awarded for successfully completed examination components and are assigned as follows:
- A the top 10 %
 - B the subsequent 25 %
 - C the subsequent 30 %
 - D the subsequent 25 %
 - E the subsequent 10 %

Data may be collected from one examination date, or one or several academic years. The basis of the data is disclosed with the ECTS grade. In the case of degree grades, the ECTS grade must be included. For individual modules, the ECTS grade may be listed when possible and necessary.

§ 12 Retaking examination components

- (1) If examination components are not passed or considered not passed, they may be retaken once.
- (2) A second retake is only possible due to severe reasons and by request to the examinations board.
- (3) If a candidate fails an examination twice, he has the right to retake max. two failed examinations without needing to provide evidence of serious reasons.
- (4) The Master's thesis may not be retaken a second time.
- (5) Retaking an examination that received a "pass" grade is not permitted.
- (6) Credits obtained in failed compulsory elective and elective modules can be replaced by credits obtained in other relevant modules. All other modules, including the Master's thesis, may not be replaced.

III. Master's examination

§ 13 Scope and nature of the Master's examination

- (1) The Master's examination consists of:
 1. examination components completed during the course of study,
 2. a research project in a working group, and
 3. the Master's thesis.
- (2) Examinations, as referred to in Section 1, No. 1, are completed orally or in writing as an integrated part of the lecture or course. The lecturer determines the nature and duration of the examination components in accordance with Section 1, No. 1 and announces these at the beginning of the course or lecture at the latest.

§ 14 Application for the Master's examination and thesis

- (1) Admission to the examination components is authorised for students who:
 1. are enrolled in the MScTI (Master of Science Computer Engineering) at Heidelberg University,
 2. have not lost their entitlement to take examinations in Computer Engineering or a comparable degree programme,
 3. do not yet have a Master's degree in Computer Engineering or are not currently participating in an examination procedure.
- (2) Candidates can only be approved for the Master's thesis if modules worth a total of 60 credits have been successfully completed.
- (3) The application for examination in accordance with Section 1 or Section 2 must be made in writing and addressed to the chairperson of the examinations board. The application must include declarations on / evidence of (list of courses with credits and grades) the prerequisites stated in Section 1 or Section 2. The examinations board makes the final decision on exceptions.
- (4) The application is the basis for the examinations board's decision as to whether the candidate may be admitted to the examination. Rejections must be presented in writing, stating the reasons and providing information on the appeals procedure.
- (5) The application for admission to the examination may only be denied if:
 1. conditions are not fulfilled in accordance with Section 1 or 2, or
 2. the candidate has failed the final attempt at the Master's examination in the degree programme Computer Engineering or has lost examination entitlement, or
 3. the candidate is currently participating in an examination procedure.

§ 15 Interdisciplinary skills

The courses listed in Attachment 1, or other courses as defined in the module handbook, must be completed in order to successfully pass the 'Interdisciplinary Skills' modules. The examinations board may, upon application, recognise other courses as well.

§ 16 Area of specialisation

- (1) The areas of specialisation introduce students to the current state of the art in science and research in computer engineering.
- (2) In order to pass the area(s) of specialisation, modules must be completed according to the credits stated in Attachment 1.
- (3) Eligible modules are identified accordingly in the module handbook.

§ 17 Research project

- (1) During the research project, students are required to work on a defined topic in a working group, to familiarise themselves with the methodological and technical basics of their work, and to gain experience related to time management and project planning. This introductory project is intended to prepare students for the Master's thesis.

- (2) The issuing body and the student coordinate both topic and terms prior to commencement of the research project.
- (3) The workload must be limited to the scope as defined in Attachment 1.
- (4) A final report on the results of the research project must be prepared.
- (5) In accordance with § 6 Section 1, the research project may only be issued and graded by authorised examiners who teach in the Faculty of Computer Engineering. The examinations board makes the final decision on exceptions.

§ 18 Master's thesis

- (1) The Master's thesis is an examination component that completes the academic programme. The purpose of the thesis is for candidates to show that they are able to work independently on a problem from the subject field of the degree programme in Computer Engineering within a given period of time and in accordance with the principles of scientific work.
- (2) The Master's thesis consists of the following submodules:
 - written Master's thesis, and
 - oral presentation (Master's thesis colloquium).
- (3) In accordance with § 6 Section 1, the Master's thesis may only be issued and supervised by authorised examiners who teach in the Faculty of Computer Engineering. The examinations board makes the final decision on exceptions.
- (4) The topic of the Master's thesis will be determined by the thesis supervisor in agreement with the candidate. The assignment must be limited in such a way that the workload as defined in Attachment 1 corresponds with the actual completion time. In accordance with § 17, the topic of the research project may be dealt with in more depth in the Master's thesis. The topic of the thesis may only be changed once, and only within the first four weeks following the date of assignment.
- (5) The thesis topic will be formally assigned by the chairperson of the examinations board. The application for admission, i.e. the beginning of the Master's thesis (see §14 Section 4) must be recorded by the examinations board.
- (6) The deadline for submission of the thesis is six months following assignment of the topic. The examinations board may, upon a substantiated request, provide a one-time extension of max. 1 month. In the case of a part-time degree, the examinations board may, upon a substantiated request, extend the deadline by two months.
- (7) If an application for assignment of a topic is submitted, the chairperson of the examinations board will ensure that the candidate receives a topic for his Master's thesis. The candidate is permitted to propose topics; however, this does not constitute legal entitlement to a particular topic.
- (8) The Master's thesis must include a declaration stating that the candidate is the author of his own work and has used no sources or aids other than those indicated.
- (9) The thesis should contain a German and an English summary.
- (10) The Master's thesis may be written in German or English.

§ 19 Submission and assessment of the Master's thesis

- (1) Three copies of the Master's thesis must be submitted to the examinations board prior to expiration of the deadline. The submission date must be recorded. If the submission deadline is exceeded, the Master's thesis will be graded as "failed" (5.0), unless the candidate is not at fault for exceeding the deadline.
- (2) The written Master's thesis is assessed by two examiners according to § 6 Section 1; one of the examiners must also be the thesis supervisor. The other supervisor is appointed by the examinations board. The candidate is allowed to make a proposal that does, however, not constitute a legal entitlement. At least one of the Master's thesis examiners must be a full-time employee at Heidelberg's Faculty of Physics and Astronomy or at Heidelberg's Faculty of Mathematics and Computer Science, and must also be involved in computer engineering research. The evaluation period should not exceed a period of four weeks.
- (3) The Master's thesis is passed if the colloquium has been passed and the written work has been graded as "sufficient" (4.0) or higher by both examiners. The grade is calculated by averaging both assessments according to §11 Section 2. If the grades differ by more than one grade point, the examinations board will determine the Master's thesis grade after consulting both examiners. In such cases, a third examiner may be consulted.
- (4) If the Master's thesis is graded as "failed" (5.0), it may be retaken with a new topic. Retaking the thesis with the previous topic is not permitted.
- (5) The Master's thesis may be presented to third parties if the candidate provides written consent.

§ 20 Presentation of the Master's thesis

- (1) As a component of the Master's thesis, the candidate must present the assignment and all results in a presentation. The student must then defend his work in a scientific discussion. The presentation should also prove that the candidate has gained sufficient knowledge in the fundamentals of the Master's thesis topic as well as in associated areas.
- (2) In general, the presentation should take place shortly after submission of the thesis. Alternatively, the candidate can choose to present the results prior to submission when the thesis is almost finished.
- (3) The presentation can take place in a group seminar, a specialised seminar or on a separate date.
- (4) The duration of the presentation is between 30 and 45 minutes.
- (5) The Master's thesis presentation is not graded.
- (6) The presentation will be announced in the faculty. All faculty members of the Faculty of Astronomy and Physics or the Faculty of Mathematics and Computer Science, as well as students who wish to present their Master's thesis at a later date may, provided that there is sufficient seating, attend the presentation. The audience can be prohibited from attending upon the candidate's request or for other valid reasons.

§ 21 Passing the examination and overall grade

- (1) The Master's examination is passed if

1. all basic compulsory modules have been passed, and
 2. all courses in the areas listed in Attachment 1 have been passed and the necessary credits have been gained, and
 3. the Master's thesis has been passed.
- (2) The exact number of credits in the areas listed in Attachment 1 (except for Master's thesis and seminar) may deviate from the stated numbers by 4 credits in order to facilitate recognition of other courses. The total amount of 120 credits must be achieved.
- (3) The overall grade of the Master's examination is calculated by weighting the grades of the graded modules (see the listed areas in Attachment 1) according to their credits. The respective compulsory modules must be included in the calculation of the grade.

§ 22 Master's diploma and certificate

- (1) After the Master's examination has been passed, a diploma (in German and English) will be issued within four weeks that indicates all individual modules with their respective grades and credits, as well as the overall grade. The diploma must be signed by the chairperson of the examinations board and is dated with the day of the last examination component.
- (2) A Diploma Supplement is included, containing additional information on course content and period of studies. The content complies with the European Diploma Supplement Model.
- (3) A Master's certificate is issued with the diploma, or in the context of a degree ceremony and bears the same date as the diploma. It certifies the conferment of the academic degree. Both Master's certificate and diploma are issued in German and English. The Master's certificate is signed by the Dean and the chairperson of the examinations board, and bears the faculty seal.
- (4) The diploma will include a supplement indicating completion of the area(s) of specialisation, if the student has completed all modules required for one or more areas of specialisation (as defined in the module handbook).
- (5) If the candidate fails the Master's examination, a certificate will be issued upon request and on presentation of relevant proof, listing passed examination components and corresponding grades as well as missing examination components. It is signed by the chairperson of the examinations board and includes a note that the Master's examination was failed. The same applies for the Master's examination if failed on the final attempt.

IV. Final provisions

§ 23 Invalidity of examinations

- (1) If a candidate cheats in an examination and is only discovered after the diploma has been issued, the examinations board may correct the examination results affected by the deception accordingly, and may declare the examination partially or completely failed.

- (2) If the requirements for admission to the examination were not fulfilled without any intent to deceive on the candidate's part, and this is only discovered after the diploma has been issued, the passed examination is considered a compensation for this shortcoming. If the candidate intentionally gained admission to the examination through deceit, the examinations board must make the final decision.
- (3) Before the decision is made, candidates will be given the opportunity to provide an explanation.
- (4) Fraudulent examination diplomas will be confiscated and a new diploma will be issued if necessary. The Master's certificate will be confiscated along with the fraudulent examination diploma if the examination was graded as "failed" due to deception. In accordance with Paragraph 1 and Paragraph 2, Sentence 2, a decision may not be made more than five years after the date printed on the examination diploma.

§ 24 Access to examination documents

- (1) The candidate may request access to written examination documents, examiner reviews and the examination minutes within a period of one year after completion of the examination procedure. The chairperson of the examinations board decides when and where access will be granted.

§ 25 Coming into force

These examination rules and regulations come into force on 1 September 2011.

Attachment 1: Areas, scope

Area / module	E/C	Graded?	ECTS
Fundamentals (3 modules)			18
• Parallel Computer Architectures	C		6
• System Design	C		6
• e.g. Electronics, Data Transmission, High Perf. Comp...	E		6
Interdisciplinary skills (2 modules)		no	12
• Tools	E		6
• Entrepreneurship	E		6
Specialisation (5 modules)	E		30
Seminar		no	4
Freely selectable courses			12
Research project			14
Master's thesis			30
Written Master's thesis			28
Final colloquium on Master's thesis		no	2
Total			120

The column E/C provides information on whether the module is an elective or a compulsory elective.

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