Please note that this document is a non-binding convenience translation. Only the German version of the document entitled "Prüfungs- und Studienordnung der Universität Heidelberg für den internationalen Master-Studiengang Scientific Computing", dated 22 April 2013 (published in the President's bulletin [Mitteilungsblatt des Rektors] of 31 May 2013, p. 485) has legal validity.

HEIDELBERG UNIVERSITY EXAMINATION AND DEGREE PROGRAMME RULES AND REGULATIONS FOR THE INTERNATIONAL MASTER'S DEGREE PROGRAMME IN SCIENTIFIC COMPUTING

dated 22 April 2013

Preamble

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

§ 23 Coming into force

I. General provisions

§ 1 Purpose of the academic programme and examination

(1) The consecutive international Master's in Scientific Computing, which is both practical and research-based, imparts in-depth specialist knowledge and academic methods relating to Mathematics and Computer Science, with a particular focus on Scientific Computing, and associated fields as chosen by the students.

(2) The purpose of the Master's examination is to assess whether students have an overview of the interconnections between the individual disciplines, are able to apply academic methods and knowledge, and have acquired the specialist knowledge required to enter into a profession or a doctorate programme.

(3) Admission to the academic programme is subject to separate admissions regulations.

§ 2 Master's degree

Heidelberg University, represented by the Faculty of Mathematics and Computer Science, confers the academic degree of "Master of Science" (abbreviated to "M.Sc.") to those who have passed the Master's examination.

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

(1) The standard period of study, including the Master's examination, totals four semesters.

(2) Examination prerequisites are determined in terms of credits in accordance with the European Credit Transfer System. One credit corresponds to a workload of approximately 30 hours. Credits are only awarded for successfully completed modules. To successfully complete a graded module, the grade "sufficient" (4.0) or better is required.

(3) The range of courses allows students to specialise in several branches of Mathematics, Computer Science or associated fields. It includes compulsory elective courses in Mathematics, Computer Science and an area of specialisation, each of which are worth 16 credits, and two seminars worth 6 credits each. In addition, there is one field of application worth 18 credits, and courses in cross-disciplinary skills equivalent to 6 credits. As a general rule, the field of application should be based on the field which was chosen for the Bachelor's examination. The Master's thesis equates to 30 credits and is

accompanied by a Master seminar worth 6 credits. A total of 120 credits (CP), acquired through completion of compulsory and elective courses, is required to successfully complete the Master's programme.

(4) Lectures and courses in the degree programme are mainly taught in English. Some courses may also be offered and examined in German.

(5) If the candidate does not fully complete the Master's examination within a period of three semesters after expiry of the standard period of study, they will lose their entitlement to take the final examinations, unless they are not responsible for this timeframe being exceeded.

§ 4 Examinations board

(1) The examinations board is responsible for the organisation of examinations and the tasks prescribed in these examination rules and regulations. It consists of three members of the full-time academic staff at the faculty. Two of these members must be professors and one must be a representative of the research associates. One additional member must be a student with an advisory function.

(2) The faculty council appoints the chair of the examinations board and their deputy as well as the board members and their deputies. The chairperson and their deputy must be professors. The student member of the board is appointed by the faculty council based on a proposal from the departmental student committee.

(3) Members are appointed for three years; the student member is appointed for one year. The term of office begins on 1 September. Members may be re-elected.

(4) The examinations board ensures that the examination rules and regulations are upheld. The board reports to the faculty regarding changes to examinations, study periods and grading on a regular basis.

(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. The examinations board can confer further responsibility on its chairperson. Such a decision may be revoked at any time.

(6) Board members have the right to attend examinations.

(7) Members of the examinations board and their deputies are subject to official secrecy. Members who are not civil servants are sworn to secrecy by the chairperson.

§ 5 Examiners and observers

(1) The chairperson, having consulted the examinations board, appoints the examiners and observers involved in examinations. Examiners must be lecturers from the Master's degree programme in Scientific Computing.

(2) In general, university examinations which are not completed during the course of study may only be carried out by professors, lecturers, associate professors, or research associates who have been granted the right to examine by the President's Office due to longstanding teaching experience.

(3) Observers must have passed the Master's examination or at least an equivalent final examination.

(4) In general, the lecturer for the respective lecture or course is responsible for determining the examination components to be completed during the course of study.

(5) According to paragraph 2, all examiners and reviewers of Master's theses must be full-time employees at the Faculty of Mathematics and Computer Science at Heidelberg University. According to paragraph 1, examiners to whom clause 1 does not apply, may only be appointed as examiners or reviewers if the second examiner or reviewer has been appointed in accordance with clause 1. For examiners and observers, § 4 paragraph 7 (official secrecy) shall apply accordingly.

§ 6 Recognition of course credits, examination results, and academic degrees

(1) Course credits and examination results as well as academic degrees that were obtained through a degree programme at another state or state-recognised higher education institution or college of cooperative education (Berufsakademie) in the Federal Republic of Germany, or through degree programmes at state or state-recognised higher education institutions abroad, will be recognised as long as the skills acquired do not differ significantly from those required for the courses and examinations or the degrees that are replaced. This recognition is required in order to continue an academic programme, take examinations, enrol in a further academic programme or be admitted to a doctoral programme. The validity of § 15, paragraphs 3 and 4 LBG (State Public Service Law) remains unaffected.

(2) Courses completed at recognised distance-learning institutions will be considered equivalent to those in a corresponding traditional study programme with regard to determining the duration of study.

(3) The applicant is responsible for providing all information necessary for credits to be recognised. It is the responsibility of the office which carries out the recognition procedure to prove that an application does not fulfil the requirements.

(4) If agreements existing between the Federal Republic of Germany and other states concerning the equivalence of university degree programmes (Equivalency Agreements) diverge from paragraph 1 and § 29, paragraph 2, clause 5 of the LHG (State Law of Baden-Württemberg on Higher Education), and thereby favour students from other states, the rules and regulations in the Equivalency Agreement shall take precedence.

(5) Examination results are to be graded on the basis of a credit system that allows credits from equivalent or similar degree programmes to be recognised; this also applies to universities of cooperative education, provided that equivalence is established.

(6) Knowledge and skills acquired outside of the higher education system are to be recognised for a degree programme at a higher education institution if:

1. the requirements for university admission are fulfilled at the time of recognition,
2. the knowledge and skills to be recognised for the university degree programme are equivalent in both content and level to the course credits and examinations which they are to replace, and
3. the recognition criteria have been verified in the context of an accreditation.

A maximum of 30 credits may be replaced by knowledge and skills acquired outside of the higher education system. A Master's thesis will not be recognised.

(7) Credits may be awarded for coursework and examination components completed in the context of refresher courses (Kontaktstudien). When recognising credits from refresher courses for a university degree programme, paragraphs 2 and 5, as well as paragraph 6, clause 1, number 1 apply accordingly. When recognising knowledge and skills gained outside of the higher education system for refresher courses, paragraph 6 applies accordingly.

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

(1) An examination is graded as "failed" (5.0) if a candidate fails to appear without being able to state a valid reason for their absence, or if they withdraw from the examination after it has started. The same applies if a written examination is not completed within the specified timeframe, unless the candidate is not responsible for exceeding the time limit.

(2) Reasons for withdrawal or absence must be plausible and must be submitted immediately, in writing, to the examinations board. If the candidate, or a child for whom the candidate is generally the sole carer, is ill, a medical certificate must be provided. In cases of doubt, a certificate may be required from a doctor of the University's choice. If the reasons are accepted, a new date for the examination will be scheduled. In this case, existing examination results are to be taken into account.

(3) When deciding whether the candidate is responsible for exceeding a deadline for registering for, or taking an, examination, the examinations board must respect the provisions stated in the Maternity Protection Act and the legal regulations concerning parental leave, and allow candidates to make appropriate use of these provisions.

(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 a candidate disrupts the proper course of the examination, they may be excluded from continuing the examination by the examiner or examination supervisor. In this case, the examination will be graded as "failed" (5.0). In severe cases, the examinations board may exclude the candidate from all further examinations.

(5) Within a period of fourteen days, the candidate may request that the decision be reviewed by the examinations board in accordance with paragraph 4 clauses 1 and 2. The candidate must be informed of negative decisions immediately and in writing; the reasons for the decision must be stipulated and information on the procedure for appeal must be provided.

§ 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 Master's thesis

(2) If the candidate provides a medical certificate credibly proving that they are unable to take examinations, either fully or partially, in the form prescribed, due to permanent or chronic health problems, the examinations board may allow them to take an equivalent examination in an alternative form. The same applies for other course requirements.

§ 9 Oral examination components

(1) In oral examination components, candidates must show that they are able to identify interconnections within the examination matter.

(2) Oral examination components are generally conducted by an examiner and a qualified observer. If there are several examiners, it is possible for one of them to act as an observer.

(3) An oral examination lasts between 15 and 60 minutes.

(4) The topics examined and the results of the oral examination must be recorded

in the minutes. The candidate must be notified of examination results immediately following the oral examination.

(5) Students seeking to take the same examination at a later date may be allowed to observe the examination, provided that there is enough space available. The student observers may not be present for the assessment or announcement of the examination results. Upon the candidate's request, or for other valid reasons, observers may be prohibited from attending the examination.

§ 10 Written examination components

(1) In written examination components, candidates must demonstrate 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 lasts between 45 and 180 minutes.

(3) If a written examination component takes the form of a term paper, candidates must assure that they are the author of their work and have used no sources or aids other than those indicated.

§ 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 lies substantially above 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.

To allow a more differentiated assessment of examination results, interim grades may be given by increasing or decreasing the individual grades by 0.3; the grades 0.7, 4.3, 4.7 and 5.3 may not be used.

(2) In general, the evaluation period for examination components should not exceed two weeks following completion of the module.

(3) Students receive a passing grade in an examination component if it has been graded as "sufficient" (4.0) or better. A module is successfully completed

when all individual sub-module examinations have been passed.

(4) The module grade is calculated using the sub-module examination grades, averaged according to the number of credits they are worth.

(5) When calculating final module grades and the overall grade, only the first digit after the decimal point is taken into account. The other digits are dropped without rounding.

(6) Grading for the final module grade and overall Master's examination grade is as follows:

for an average up to and including 1.5	very good
for an average of between 1.6 and up to/including 2.5	good
for an average of between 2.6 and up to/including 3.5	satisfactory
for an average of between 2.6 and up to/including 4.0	sufficient

(7) If grades are awarded in accordance with the European Credit Transfer System ECTS, the international assessment standard specified in Appendix 5 is applied.

§ 12 Retaking examination components

(1) If examinations components are not passed, or are considered not to have been passed, they may be retaken once.

(2) A second retake is only possible due to severe reasons and only upon request to the examinations board. A second retake of the Master's thesis is not possible.

(3) It is not permitted to retake an examination component which has been graded as passed.

(4) If an examination component is failed, it must be retaken within a reasonable timeframe (one year). If an examination component in a compulsory elective or elective module is failed once, the candidate's entitlement to take the final examination may be revoked. The credits required for completion of the Master's degree programme may then be obtained through other relevant modules.

II. Master's examination

§ 13 Scope, nature and organisation of the Master's examination

(1) The Master's examination consists of:
1. the examination components completed during the course of study, in accordance with Appendices 1 to 4

2. the Master's thesis

(2) Examinations as referred to in paragraph 1, number 1 are taken as an integrated part of the lecture or course. They can be in written or oral form. The lecturer responsible for a lecture or course determines the nature and duration of the examination components in accordance with paragraph 1, number 1, and announces this information no later than at the beginning of the lecture or course.

(3) Module examinations may consist of several sub-module examinations.

§ 14 Admission requirements and procedure

(1) Admission to the individual examination components is only authorised for students who:
1. are enrolled in the Master's degree programme in Scientific Computing at Heidelberg University,
2. have not lost their entitlement to take the final examination in the Master's or Diplom degree programme in Scientific Computing, or in other degree programmes with comparable content, or in the teaching degree programmes in Mathematics or Computer Science.

(2) Students who have completed examination prerequisites worth a total of 45 credits may be permitted to write the Master's thesis.

(3) The decision on admission to the Master's thesis is made by the chair of the examinations board.

(4) The application for conferral of the Master's degree must be made in writing and addressed to the chair of the examinations board. Such an application must include the following documents:

1. Evidence of examination prerequisites totalling 90 credits according to the catalogue of compulsory and compulsory elective modules in Scientific Computing (Appendices 1 to 4) and of the successfully completed Master's thesis;
2. a declaration stating whether the candidate has previously failed a Master's examination or a final Diplom examination in Mathematics, Computer Science, Scientific Computing or in a degree programme with comparable content, or has failed the examination in a teaching degree programme in Mathematics or Computer Science, or is currently involved in an examination procedure in one of the aforementioned degree programmes;
3. a declaration stating that the candidate has not lost their entitlement to take the final examinations in the Master's degree programme in Scientific Computing.

(5) The chair of the examinations board makes the decision on the application.

Rejections must be substantiated and notified in writing along with instructions for appeal.

(6) If candidates are unable to provide such evidence, the examinations board may accept other proof.

(7) The application will be rejected if:
1. the conditions stated in paragraph 1 are not fulfilled, or
2. the documents are incomplete, or
3. the candidate has failed a Master's examination or a final Diplom examination in Scientific Computing, Mathematics, Computer Science or in another degree programme with comparable content, or in a teaching degree programme in Mathematics or Computer Science, or
4. the candidate has lost their entitlement to take the final examinations in a degree programme according to number 3 for other reasons, or
5. the candidate is currently involved in an examination procedure in a degree programme in accordance with number 3.

§ 15 Master's thesis

(1) The Master's thesis is an examination component that concludes the academic programme. The purpose of the Master's thesis is for candidates to show that they are able to work independently on a problem from the field of Scientific Computing within a given period of time and using academic methods.

(2) The Master's thesis may be assigned and supervised by any authorised examiner in accordance with § 5, paragraph 2.

(3) The topic of the Master's thesis will be determined by the thesis supervisor in consultation with the candidate. Upon request, the chair of the examinations board ensures that the candidate receives a topic for their Master's thesis in due time. The candidate shall be given the opportunity to propose topics. However, this does not constitute a legal entitlement to a particular topic. The thesis topic shall be assigned by the chair of the examinations board; the date of assignment must be recorded.

(4) In total, 30 ECTS are allocated for the Master's thesis. The deadline for submission of the thesis is six months after assignment of the topic. In exceptional circumstances, the examinations board may extend this deadline by a period of three months. If the deadline is missed, the Master's thesis will be graded as "failed" (5.0), unless the candidate is not responsible for the deadline being exceeded.

(5) The topic, task and scope of the Master's thesis must be limited in such a way that the candidate is able to complete the thesis within the given period.

(6) The thesis should contain a summary in German and English.

(7) The Master's thesis is to be written in English; upon request, it may, however, be written in German.

§ 16 Submission and assessment of the Master's thesis

(1) Three copies of the Master's thesis must be submitted to the examinations board before the deadline; the submission date must be recorded.

(2) On submission of the Master's thesis, the candidate must assure, in writing, that they are the author of their own work and that no sources or aids other than those indicated have been used.

(3) The Master's thesis is assessed by two examiners in accordance with § 5, paragraph 5. The thesis supervisor should be the first examiner. The candidate has the right to make a suggestion; this does not, however, constitute a legal entitlement. The assessment period should not exceed four weeks.

(4) The grade is calculated as the average of both assessments; § 11, paragraph 5 applies accordingly. If the two assessments differ by more than one grade, the examinations board will determine the grade for the Master's thesis after consulting both examiners. In such cases, a third examiner may be consulted.

(5) If the Master's thesis is graded as "failed" (5.0), it may be retaken on a new topic; retaking the thesis with the previous topic is not possible.

(6) The Master's thesis may be presented to third parties if the candidate provides written consent.

§ 17 Presentation of the Master's thesis

(1) As part of the Master's thesis, the candidate must hold an oral presentation on the thesis content. Candidates shall present and defend the findings of their Master's thesis in a discussion with the examiners. In this presentation, the candidate must prove that they have sufficient knowledge of the basic principles of the Master's thesis topic and associated fields. This oral presentation must be completed within two weeks of submission of the Master's thesis.

(2) In accordance with § 16, paragraph 3, the Master's thesis must be presented in the presence of both examiners. The grade for this presentation is included in the assessment of the Master's thesis. If an external examiner is involved in the examination process, the presence of one examiner suffices.

(3) The oral presentation of the Master's thesis lasts between 30 and 60 minutes.

(4) The presentation of the Master's thesis will be announced within the faculty. All faculty members as well as students of the degree programme may attend the presentation if sufficient space is available. Upon the candidate's request, or for other valid reasons, observers may be prohibited from attending the examination.

§ 18 Passing the examination, overall grade

(1) The Master's examination is passed if all examination components completed during the course of study and the Master's thesis have been graded as "sufficient" (4.0) or better.

(2) For the assessment of all examination components, and the overall grade, § 11 applies accordingly.

(3) When calculating the overall grade for the Master's examination, all grades for the modules listed in Appendices 1 to 4, and the Master's thesis grade, are weighted according to the number of credits they are worth and multiplying factors.

(4) By resolution of the examinations board, the faculty may confer the academic degree "with distinction" if the overall grade is "very good" and the candidate performed exceptionally.

§ 19 Master's diploma

(1) Once the Master's examination is passed, a diploma will be issued within four weeks. This will list all individual modules with their respective grades and credits, and the overall grade. The diploma bears the date of completion of the last examination component and must be signed by the chair of the examinations board.

(2) A "Diploma Supplement" in English and German is also provided, containing additional information about the course content and period of study.

§ 20 Master's certificate

(1) The candidate is issued with a Master's certificate along with a diploma, bearing the same date. It certifies the conferment of the academic degree.

(2) The Master's certificate is signed by the Dean and the chair of the examinations board. It bears the faculty seal.

(3) If the Master's examination is failed, the chair of the examinations board will issue a signed certificate, upon request and upon presentation of supporting documents, that lists any completed examination components and their

respective grades as well as the examination components still required for passing the Master's examination, and which indicates that the Master's examination has been failed. The same applies for the Master's examination, if it is failed on the final attempt.

III. Final provisions

§ 21 Invalidity of examinations

(1) If a candidate has cheated on an examination component and this is not discovered until after the diploma has been issued, the examinations board maintains the right to alter the grade awarded for all examination components concerned, and declare the examination partially or completely failed.

(2) If the requirements for admission to the examination were not fulfilled, but without any intent on the candidate’s part to cheat, and this is not discovered until after the diploma has been issued, the passed examination will be considered as compensation for this shortcoming. If the candidate intentionally gained admission to the examination through deceit, the examinations board will make a decision on the matter.

(3) Before a decision is made, candidates will be given the opportunity to provide an explanation.

(4) Fraudulent examination diplomas will be confiscated and, if necessary, a new diploma will be issued. If the examination has been graded as "failed" due to cheating or deceit, the Master's certificate will be confiscated along with the fraudulent examination diploma. In accordance with paragraph 1 and paragraph 2, clause 2, a decision may not be made more than five years after the date indicated on the examination diploma.

§ 22 Access to examination documents

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. The chair of the examinations board decides when and where access will be given.

§ 23 Coming into force

(1) These examination rules and regulations become effective on the first day of the month following their publication in the President’s bulletin (Mitteilungsblatt des Rektors). At this point they supersede the Examination and Degree Programme Rules and Regulations for the Master’s degree programme in Scientific Computing dated 16 March 2009 (President’s bulletin dated 8 April 2009, p. 541), last amended on 22 July 2010 (President’s bulletin dated 30

August 2010, p. 1197).

(2) Students who are already enrolled in the Master's degree programme in Scientific Computing at Heidelberg University at the point at which these rules and regulations come into force may request to continue their course of studies in accordance with the former rules and regulations for a period of up to two years. The request must be made to the examinations board within three months of the start of the lecture period that follows the implementation of these examination rules and regulations.

Appendix 1

Structure of the International Master's in Scientific Computing

1.Year	
Compulsory Elective: Mathematics I+II	16 CP
Compulsory Elective: Computer Science I	16 CP
Fields of Application I+II	18 CP
2 Seminars (or Practicals)	12 CP
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	62 CP
2.Year	
Compulsory Elective: Area of Specialisation I+II	16 CP
Cross-disciplinary Skills	6 CP
1 Seminar	6 CP
Master's Thesis	30 CP
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	58 CP
	120 CP

Explanations and Comments

(1) The modules are interchangeable in terms of the semester in which they are selected, as long as this does not disrupt the sequence of the lectures.

(2) If students wish to develop their basic knowledge, they may select up to two compulsory elective modules from the range of courses offered in the Bachelor's degree programme in Mathematics, provided that these modules were not included in the Bachelor's examination.

(3) Of the seminars available, one should be chosen from the field of Mathematics and one from Computer Science or Scientific Computing. The latter may also be replaced by an advanced practical within one of these fields.

(4) The seminar must be taught by the Master's thesis supervisor.

(5) With agreement from the thesis supervisor, 6 to 8 credits for the area of specialisation may be awarded for "Scientific Specialisation" through taught literary studies.

(6) Courses in cross-disciplinary skills are not graded.

Appendix 2

Subject modules

Compulsory elective courses in Mathematics or Computer Science are listed in the module handbook for the degree programme.

Area of specialisation

An area of specialisation, in which the Master's thesis is written, is to be chosen by the start of the third semester. This specialisation may be formed of advanced lectures in Mathematics and Computer Science relating to Scientific Computing as listed in the module handbook, or of the current range of special lectures. The selection is to be agreed with the thesis supervisor at the start of the third semester.

Explanations and Comments

(1) At least 3 modules from the compulsory elective fields of Mathematics and Computer Science are included in the range of courses every semester.

Appendix 3

Cross-disciplinary Skills

Mathematical Colloquium, depending on semester	2 - 6 CP
Software Practical, depending on workload	3 - 6 CP
Industry Practical, depending on duration	3 - 6 CP
Participation in holiday courses or summer schools	3 - 6 CP
Semester Abroad, depending on number	3 - 6 CP
Tutoring Position, depending on number of semesters	3 - 6 CP
Cross-disciplinary Skills from the programmes offered at the University	up to 6 CP

Appendix 4

Fields of Application

Courses for fields of application are listed in the programme's module handbook.

Explanations and Comments

(1) The field of application should build on the field of application chosen in the Bachelor's degree programme.

(2) The credits for the field of application are obtained in the module entitled "Field of Application". More information can be found in the module handbook. Students must ensure that they do not select modules that were completed in their Bachelor's degree programme as their field of application.

(3) The degree programmes presented in the fields of application are suggestions. They may be replaced by other comparable module combinations in agreement with the Dean of Studies.

Appendix 5

Grading in accordance with ECTS

ECTS grades are awarded for successfully completed examination components and are assigned as follows:

A the top 10%
B the following 25%
C the following 30%
D the following 25%
E the following 10%

Data may be collected from one examination date, or one or more academic years. The basis of the data is disclosed with the ECTS grade.

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