

# OFFICIAL ANNOUNCEMENTS

Official Gazette of the University of Wuppertal

Issued by the Rector

**No\_29 YEAR 43**

**May 19, 2014**

**Examination regulations for the  
Master's degree program "Computer Simulation in Science"  
at the University of Wuppertal  
dated 19.05.2014<sup>1</sup>**

In accordance with § 2 section 4 and § 64 section 1 of the Higher Education Act (HE Act) of the State of North Rhine-Westphalia (NRW) dated 31.10.2006 (State Law Gazette for NRW p. 474), last amended by Act of 3.12.2013 (State Law Gazette p. 723), the University of Wuppertal has enacted the following examination regulations.

## Contents

### I. General regulations

- § 1 Aims of the degree program, purpose of examinations, admission requirements
- § 2 Degree awarded
- § 3 Standard period of study and workload
- § 4 Examination times and deadlines
- § 5 Examinations committee
- § 6 Examiners and co-examiners
- § 7 Transfer of credits for periods of study, courses completed, and examination grades
- § 8 Default, withdrawal, deception, infringement of regulations

### II. Master's degree examination

- § 9 Admission to the examination
- § 10 Nature and scope of the master's examination
- § 11 Examinations, proof of achievement, credit points
- § 12 Compensation for disadvantage
- § 13 Types of examination
- § 14 Credit points account and recording of credit points
- § 15 Master's thesis
- § 16 Assessment grades
- § 17 Supplementary credits
- § 18 Examination certificate
- § 19 Master's degree certificate

### III. Further regulations

- § 20 Invalidity of master's examination, revocation of master's degree
- § 21 Inspection of the examination files
- § 22 Transitional provisions
- § 23 Promulgation and publication

Annex: Module descriptions

---

<sup>1</sup> This document refers to and is a translation of the "Prüfungsordnung für den Masterstudiengang Computer Simulation in Science an der Bergischen Universität Wuppertal vom 19.05.2014, Amtliche Mitteilungen Nr. 29/2014". In case of differences in interpretation the German text is the only legal source of information.

## I. General regulations

### § 1

#### Aims of the degree program, purpose of examinations, admission requirements

(1) The master's examination completes the master's degree program in Computer Simulation in Science as a professional qualification. Successful graduates are able and qualified to apply computer simulation methods in research and industry. The application of such methods to problems in the natural sciences has familiarized them with complex models and modeling processes. The master's degree program in Computer Simulation in Science (CSiS) lays special emphasis on the application of computer-based techniques and methods to problems of modern research.

(2) The master's program aims to provide students with the knowledge, skills and methodologies relevant to the changing requirements of the professional world in such a way that they are able and qualified to work scientifically, to evaluate scientific knowledge critically, and to act responsibly.

(3) Admission requirements to the master's program in Computer Simulation in Science are as follows:

1. A bachelor's degree with a standard period of study of at least 6 semesters and a workload of at least 180 ECTS credit points, with an overall pass grade of 3.0 or better (rounded down to the first decimal point in the German grading scheme) from a university (or university of applied science), or a degree that is at least equivalent to this in a relevant discipline: applied sciences, chemistry, electrical engineering, financial mathematics, mechanical engineering, mathematics, physics, safety engineering, or a related discipline.

Applicants must, in addition, have gained the following credit points either in, or transferable to, the following areas:

Knowledge of a programming language 8 CP and

Atmospheric Physics: 24 CP or

Experimental Physics (Mechanics, Electricity and Magnetism, Atoms and Molecules), Thermodynamics, Data Analysis and Statistics

Computational Electromagnetics: 24 CP or

Electromagnetics/Electromagnetic Theory, Applied Mathematics, Numerical Techniques in Engineering/Computational Engineering

Computational Fluid Mechanics: 24 CP or

Fluid Mechanics, Numerical Methods (or similar)

Experimental Particle Physics: 24 CP or

Mechanics, Electricity and Magnetism, Atomic Physics, Basic Quantum Mechanics, Nuclear Physics, Basics of Elementary Particle Physics

Financial Mathematics: 24 CP or

Analysis I, II and III, Linear Algebra I and Introduction to Stochastic Calculus, Introduction to Numerical Analysis, Theory of Ordinary Differential Equations, Functional Analysis

Materials Science: 24 CP or

Physical Chemistry (including Introductory Thermodynamics), Modern General Physics

Theoretical Chemistry: 24 CP or

Elementary Quantum Mechanics, Basic Electronic Structure Theory, Thermodynamics, Introductory Reaction Kinetics, Physics for Chemistry Students

Theoretical Particle Physics: 24 CP

Quantum Mechanics, Elementary Particle Physics, Theoretical Physics (Mechanics, Electromagnetism, Thermodynamics).

Transfer of credit points is determined by the examinations committee. If an applicant's knowledge is inadequate for selection of one of the specializations, extra conditions may be specified for admission. Mathematical knowledge at science or engineering (bachelor's) degree level is presupposed.

2. Adequate knowledge of English. Applicants whose mother tongue is not English, or whose first bachelor's degree (professional qualification) in accordance with no. 1 above was not gained in a program conducted in English must provide proof of their competence in English by
- achieving a minimum of 79 points in TOEFL2 iBT (Internet-based) or
  - achieving 550 points in TOEFL PBT (paper-based) or
  - achieving a band score of 6.0 in the IELTS test or
  - passing the Cambridge Certificate in Advanced English (level 4) or
  - other proof of language competence equivalent to level B2 of the European Framework of Reference for Languages.
- (4) Admission to the master's program is decided by the examinations committee on the basis of the documentation submitted. In case of foreign students from abroad who are not equated with Germans by or based on agreements under international law and whose education certificates do not allow the doubtless conclusion on compliance or non-compliance of the entry requirements acc. to para. 3, in accordance with § 49, para. 9 University and College Act in particular cases the examination committee can ask for the proof of the ability to study in form of an oral examination of at least 30 minutes and utmost 45 minutes the result of which has to be documented in written form.
- The decision will be immediately communicated to the applicant in writing. If the application is rejected, reasons must be given and instruction provided about available legal remedies.
- (5) The examinations committee can make admission to the master's program conditional on the gaining of extra credits and examination passes in the areas listed in section 3 no. 1 (extra conditions). The examinations committee may determine, in the notification of admission, a deadline by which these conditions must be fulfilled.
- (6) If the documentation required by section 3 is, for reasons lying beyond the control of the applicant, not yet complete, available items of documentary proof may be submitted individually. The examinations committee can exceptionally in this case grant admission to the master's program for a period of up to 6 months after commencing the program, on condition that the required documentary evidence is supplied in full within that time (HE Act § 49, section 7, sentence 4).

## **§ 2**

### **Degree awarded**

The University of Wuppertal awards the degree of Master of Science (abbreviated MSc) to candidates who are successful in the master's examination.

## **§ 3**

### **Standard period of study and workload**

- (1) The standard duration of the master's degree program in Computer Simulation in Science, including the master's thesis, is four semesters.
- (2) The overall workload for the program, including contact hours, preparatory and complementary study and the master's thesis comprises 120 credit points (CPs), of which 30 CPs are reserved for the master's thesis and colloquium. One CP represents an average workload of 30 hours (ECTS credit points).

## **§ 4**

### **Examination times and deadlines**

- (1) Examination times must be arranged in such a way that the master's program, including the thesis, can be completed fully within the standard period of study.
- (2) Examinations are as a rule to be completed before the end of the semester in question.
- (3) Registration for module examinations (§ 11) must take place at least 3 weeks before the

examination date.

- (4) For exams offered as services from other departments/faculties, the service provider determines the registration period.

## **§ 5**

### **Examinations committee**

- (1) The examinations are organized by an examinations committee constituted by the Faculty of Mathematics and Natural Sciences (Faculty C). The committee consists of seven members: four professors, one non-professorial member of faculty, and two students. The chairperson, deputy chairperson and other members are appointed by the Faculty Board. Appointments are for two years and may be repeated.
- (2) The examinations committee is an official body as determined by administrative procedural law and the code of administrative practice.
- (3) The examinations committee ensures that examination regulations are duly observed and that examinations are conducted in accordance with regulations. It is in particular responsible for decisions in the event of objection to decisions taken in the course of examinations. The examinations committee reports regularly, and at least once a year, to the faculty about the development of examinations and the times taken to complete the degree program, including the actual time taken to assess and process the master's thesis, as well as about the distribution of overall and individual subject grades. The report must be published by the university in a suitable manner. The examinations committee makes suggestions for the reform of the examination regulations and the degree program. The examinations committee can delegate performance of its regular tasks to the chairperson and deputy chairperson; this does not apply to decisions about objections or to the report to the faculty.
- (4) The examinations committee constitutes a quorum when, in addition to the chairperson or deputy chairperson and at least one other professor, at least a total of half the members entitled to vote are present. The committee's decisions are by simple majority. In the event of parity of votes, the vote of the chairperson is decisive. Student members of the committee are active in the evaluation, recognition and transfer of course and examination credits, but not in decisions concerned with the academic subject, with setting examination questions, or with the appointment of examiners and co-examiners.
- (5) Members of the examinations committee are entitled to be present at examinations.
- (6) Meetings of the examinations committee are not open to the public. Members of the committee are bound by virtue of their office to confidentiality. Members who are not in public service must be bound to confidentiality by the chairperson of the examinations committee.

## **§ 6**

### **Examiners and co-examiners**

- (1) The examinations committee appoints examiners and co-examiners. This task may be delegated to the chairperson. Examiners must possess at least a relevant master's or diploma degree or equivalent and, unless there are serious reasons to the contrary, have taught independently in the subject in question. Co-examiners must possess at least a relevant master's or diploma degree or equivalent.
- (2) Examiners and co-examiners act independently in their function as examiners.
- (3) The chairperson of the examinations committee will ensure that the names of the examiners are made known to the candidates in due time, at least four weeks before the date of the examination in question. A notice on the announcement board is sufficient.
- (4) Examiners and co-examiners are bound in accordance with § 5, section 6, sentences 2 and 3.

## **§ 7**

### **Transfer of credits for periods of study, courses completed, and examination grades**

- (1) Credits gained in a degree program at another university within the domain of the German

Constitutional Law will be transferred ex officio to the same degree program at the University. Credits gained in other degree programs or at other universities or professional academies maintained or recognized by the state within the domain of the German Constitutional Law must be recognized if they do not substantially diverge in content from the credits they would replace. Credits recognized in this way will be transferred in the form of course or examination credits to the modules listed in these examination regulations; they may also be transferred as modules in their own right to the elective area of the master's program. Upon application, the same ruling governs credits gained at universities outside the domain of the German Constitutional Law. Upon application, the University can accept other knowledge and qualifications on the basis of submitted documentation and transfer this in the form of credits to a degree program. On application, other knowledge and qualifications shall be recognised up to a maximum of half of the study and examination credits on the basis of submitted documents if these knowledge and qualifications are equivalent in content and level to the examination credits they are intended to replace.

- (2) Recognition and transfer of periods of study and course and examination credits gained at a foreign university must be regulated in accordance with the equivalence agreements adopted by the Standing Conference of Ministers of Education and Cultural Affairs and the University Rectors' Conference, as well as with university partnership agreements. In cases of doubt the University International Office and the Central Office for Foreign Education may also be consulted.
- (3) Recognition and transfer of periods of study and course and examination credits gained in a state-recognized distance learning university or in distance learning modules developed by the State of North Rhine-Westphalia in cooperation with the other German states and with federal authorities follows sections 1 and 2.
- (4) Decisions on recognition and transfer in accordance with sections 1-3 are made by the examinations committee. Students must submit the documentation required for this purpose in the form determined by the examinations committee. The decision must be made within three months from the date of full submission of all information required for the application in question. The examinations committee can delegate the decision about recognition and transfer to the chairperson or deputy chairperson of the examinations committee.
- (5) When course or examination credits are transferred, the grades – insofar as the grading schemes in question are comparable – are also to be transferred and assumed into the calculation of the overall grade. If the grading schemes are not comparable, the credit will be transferred with the annotation “pass”. The transfer will be noted in the certificate.
- (6) If the conditions stated in sections 1-3 are fulfilled, there is a legal right to transfer of credits.
- (7) If recognition or transfer of credits is refused, reasons for this refusal must be given and the applicant must be informed in writing without delay and instruction provided about available legal remedies.

## **§ 8**

### **Default, withdrawal, deception, infringement of regulations**

- (1) A part-examination will be deemed failed (grade 5.0) if the candidate without good reason fails to appear for the examination or withdraws from it after it has begun. The same holds if a written examination assignment is not submitted within the deadline. With the exception of the master's thesis, candidates can, without giving a reason, withdraw their registration for module examinations up to one week at the latest before the examination date.
- (2) The reasons given for withdrawal or default in accordance with section 1 sentences 1 and 2 must be submitted without delay in writing to the examinations committee together with substantiating evidence. If the reason given is sickness, the committee can require the candidate to submit a medical certificate confirming inability to sit the examination. In individual cases the chairperson of the examinations committee can require a medical certificate from a fiduciary physician designated by the committee. If the examinations committee accepts the submitted reasons, this will be communicated to the candidate in writing.
- (3) If the candidate attempts to influence the result of the part-examination through deception or the use of inadmissible aids, the part-examination in question will be deemed failed (grade 5.0); the facts of the matter will be determined by the examiner and officially recorded by the examiner or invigilator.

Moreover, in serious cases, or in the event of repetition, the examinations committee can, after consulting with the Faculty Board, declare prior part-examinations failed, or can revoke the right to repeat the examination and declare the entire examination definitively failed. A candidate who disturbs the orderly process of examination in accordance with relevant regulations can, as a rule after due warning, be excluded by the examiner or invigilator from further participation in the examination; in this case the [part-]examination in question will be deemed failed (5.0); the reasons for the candidate's exclusion must be officially recorded. In serious cases the examinations committee can exclude the candidate from further part-examinations. Before a decision is made, the candidate must be given an opportunity to state her or his case.

- (4) Candidates can within 14 days require decisions made in accordance with section 3 sentence 1 and sentence 3 to be reviewed by the examinations committee.
- (5) Encumbering decisions must be communicated to the candidate in writing without delay, giving reasons and providing instruction about available legal remedies.

## **II. Master's degree examination**

### **§ 9**

#### **Admission to the examination**

The master's examination is open to candidates who

- are enrolled in the master's degree program in Computer Simulation in Science at the University of Wuppertal in accordance with § 1 section 3, or as subsidiary students in accordance with the HE Act § 52 section 2 HG
- have submitted a declaration that they have not, at a university within the domain of the German Constitutional Law, definitively failed any examination required by these examination regulations, and that they are not currently involved in an examination procedure in the same degree program; the same applies for related or comparable degree programs and for examination procedures in other university degree program modules that do not essentially differ from those listed in § 10.

### **§ 10**

#### **Nature and scope of the master's examination**

- (1) The master's examination comprises successful completion of the modules and master's thesis. Candidates who gain 120 credit points in the modules and module examinations as described below (see Annex) pass the master's examination. The module descriptions are a constitutive part of these examination regulations. Module examinations are held on the continuous assessment model i.e. at the end of each module; the credit points record is kept by the examinations committee.
- (2) The master's examination covers the following areas:

Compulsory modules (a total of 74 CP can be achieved) :

1. Computer Simulation (36 CP)	
CSim1: Computer Simulation 1	11 CP
CSim2: Computer Simulation 2	13 CP
CSim3: Computer Simulation 3	12 CP
2. Computer Science (16 CP)	
CS1: Computer Science 1	9 CP
CS2: Computer Science 2	7 CP
3. Numerical Methods (22 CP)	
NM1: Numerical Methods 1	8 CP
NM2a: Numerical Methods 2a	8 CP
NM2b: Numerical Methods 2b	8 CP
NM3: Numerical Methods 3	6 CP

Elective modules (in the modules of the specializations chosen by the candidates 16 CP can be achieved)

A Atmospheric Physics	
AtmP1: Atmospheric Physics 1	8 CP

AtmP2a: Atmospheric Physics 2a	8 CP
AtmP2b: Atmospheric Physics 2b	8 CP
B Computational Electromagnetics	
CEM1: Computational Electromagnetics 1	8 CP
CEM2: Computational Electromagnetics 2	8 CP
C Computational Fluid Mechanics	
CFM1: Computational Fluid Mechanics 1	8 CP
CFM2: Computational Fluid Mechanics 2	8 CP
D Experimental Particle Physics	
EPP1: Experimental Particle Physics 1	8 CP
EPP2: Experimental Particle Physics 2	8 CP
E Financial Mathematics	
FM1: Financial Mathematics 1	8 CP
FM2: Financial Mathematics 2	8 CP
F Imaging in Medicine	
IMG1: Imaging 1	8 CP
IMG2: Imaging 2	8 CP
G Materials Science	
MSci1: Materials Science 1	8 CP
MSci2: Materials Science 2	8 CP
H Theoretical Chemistry	
TC1: Theoretical Chemistry 1	8 CP
TC2: Theoretical Chemistry 2	8 CP
I Theoretical Particle Physics	
TPP1: Theoretical Particle Physics 1	8 CP
TPP2: Theoretical Particle Physics 2	8 CP

**(3)** On the basis of the module descriptions a module reference book is issued. The module reference book contains obligatory and detailed information about

- the structuring module components, especially descriptions of contents as well as the form and extent of the courses,
- the distribution of the workload for preparing the participation at the individual module components and the corresponding post-processing,
- the perhaps obligatory or recommended conditions to participate at courses and the module,
- the choice between alternative module components,
- the extent of the workload of the module examination and the non-graded assignments as far as it is not yet included in the stated workload of the module components as well as
- additional information for detailed description of the study and the examination.

The module reference book has to be published conveniently. It can be adjusted if necessary and in consideration of the guidelines of para. 2 and the module descriptions (annexe to the examination regulations).

## § 11

### Examinations, proof of achievement, credit points

- (1)** Examinations earning credit points require candidates to demonstrate that they know and understand the area in question, that they can recognize specific issues relating to this area, and that they can solve problems by applying the common methods of the discipline. Module examinations are conducted in line with the module descriptions (see Annex).
- (2)** If the module description allows different forms of examination, the examiner must determine the form of the examination with the agreement of the examinations committee for the subject i.e. module in question. A notice on the announcement board or on publicly accessible Internet pages is sufficient.
- (3)** Credit points are gained on the basis of recognizable individual achievement. Examinations must be graded in accordance with § 16 section 1.
- (4)** Examinations which, according to the module descriptions, can only be repeated a restricted number of times must be assessed by two examiners. This is not necessary if a candidate who fails the examination will be allowed at least one further attempt. The grade awarded is the arithmetic mean of

the grades proposed by the individual examiners.

- (5) The grade awarded in written examinations in accordance with section 2 must be communicated to the candidate within 6 weeks at the latest.
- (6) Examinations in accordance with section 3 can, when failed or deemed failed, be repeated unrestrictedly or two times in line with the relevant module description (see Annex). An examination that has been passed may not be repeated.
- (7) The form in which non-graded assignments can contribute to the assessment of a module must, unless the examination regulations or module descriptions determine otherwise, be laid down by the instructor in the course program announcement. Examiners and instructors are urged to ensure that the workload for non-graded assignments and their preparation time does not exceed the workload as determined by credit points.

## **§ 12**

### **Compensation for disadvantage**

- (1) Candidates who submit a physician's certificate attesting that because of sustained or chronic physical disability they are unable to take the examination wholly or partly in the set form must be allowed by the chairperson of the examinations committee to take an equivalent examination in another form. The same applies to course assignments.
- (2) For seriously disabled candidates as defined by Social Security Code IX, for the physically disabled, and for the chronically sick, exceptions must be made to the provisions of the examination regulations and organizational requirements and deadlines, taking appropriate account of the disability or chronic sickness in question. Applications for such exceptions must be submitted at the time of registration for the first module examination.
- (3) For candidates covered by the provisions of §§ 3, 4, 6 and 8 of the Maternity Protection Act, or of the Parental Benefit and Parental Leave Act, the examination conditions as laid down in these regulations must, upon application by the candidate, be determined by the examinations committee, taking account of the individual case.

## **§ 13**

### **Types of examination**

Examinations can be taken in the following regulated forms in accordance with the module description. If module descriptions provide for alternative forms of examination, the form of examination shall be determined in accordance with the module description.

#### **1. Oral examinations**

- a) Oral examinations seek to determine whether candidates can address and present issues from the area under examination, and relate to and answer specific questions in this area.
- b) Oral examinations must be conducted individually by an examiner in the presence of a co-examiner who is versed in the subject. The presence of a co-examiner is not necessary if a candidate who fails the examination will be allowed at least one further attempt. Moreover, if the legal acceptability of the examination is not assured, oral examinations must always be held jointly by several examiners or by one examiner in the presence of a co-examiner who is versed in the subject. The duration of oral examinations must be set in the module descriptions as between 20 and 60 minutes.
- c) The examiner must determine the grade of the oral examination in accordance with § 16 section 1 on the basis of the candidate's overall performance. Before doing so, the examiner must consult the co-examiner.
- d) The main points and results of the examination must be put on file. Candidates must be told the result of the examination immediately afterward.
- e) If space allows, students who intend to take the same examination at a later date must, unless the candidate objects, be admitted to the examination as auditors. This does not entitle them to attend the examiners' consultation or the communication of the results of the examination.

#### **2. Written examinations (invigilated)**

- a) Invigilated written examinations seek to determine whether candidates can, within a restricted time



and with restricted aids, complete a task appropriate to the requirements of the degree program. The duration of written examinations must be set in the module descriptions as between 60 and 240 minutes. Tasks must be set in such a way that they test basic knowledge of the material and methods of the subject, as well as the ability to apply knowledge to a specific issue.

- b) Invigilated written examinations must in principle be assessed by two examiners. This is not necessary in the case of module examinations where a candidate who fails will be allowed at least one further attempt. Assessment is in accordance with § 16 section 1.
- c) When assessment of a written examination is by several examiners, the grade awarded is the arithmetic mean of the grades proposed by the individual examiners. The assessment must be communicated to the candidate within 6 weeks of the date of the examination. Candidates must be given the opportunity to inspect their examination script within one month of the date of communication of the assessment.

### **3. Written assignments**

- a) Examinations in the form of written assignments seek to determine whether, within a restricted time, candidates can independently complete, in terms of content as well as method, a task appropriate to the requirements of the degree program, and can present the result in a manner that is both scientifically and linguistically appropriate. The topic, length and time allotted for completion of the written assignment must be determined by an examiner.
- b) Examinations in the form of written assignments must in principle be assessed by two examiners. This is not necessary in the case of module examinations where a candidate who fails will be allowed at least one further attempt. Assessment is in accordance with § 16 section 1.
- c) When assessment of a written assignment is by several examiners, the grade awarded is the arithmetic mean of the grades proposed by the individual examiners. The assessment must be communicated to the candidate within 6 weeks of the submission deadline. Candidates must be given the opportunity to inspect their written assignment within one month of the date of communication of the assessment.

### **4. Portfolios**

- a) In the portfolio examination-form the candidate completes several tasks spread over one or more semesters in the form of write-ups of practical exercises, minutes, lectures, or other assignments that are related to several different module components belonging to a single module and/or courses.
- b) The individual components of the portfolio are evaluated and assessed by an examiner appointed in accordance with § 6. The module descriptions can determine beyond this form of the assessed portfolio that assessment and evaluation of the entire portfolio is connected with a final individual achievement in the form of either an oral examination, a written examination (Klausur) or a term paper according to the regulations made elsewhere in the examination regulations.  
The grade awarded in accordance with § 16 covers all the assignments completed within the framework of the portfolio, including (where applicable) the concluding examination mentioned above.
- c) The module descriptions may determine that the individual components of the portfolio undergo prior non-binding evaluation and assessment by the relevant instructor, who is appointed as an examiner for this purpose in accordance with § 6. So long as the number of individual assignments in the portfolio does not exceed the number of components in the module, the module descriptions may also determine that this prior assessment be documented for the examinations committee, which will make it available to the examiner for the final overall evaluation and assessment of the portfolio.
- d) If the module descriptions make no provisions about the form, the allotted time and/or the documentation of the individual assignments, the examinations committee will announce in due time, as a rule at the beginning of the teaching semester at the latest, the form and deadlines applicable to the individual portfolio assignments, how they are to be documented, and (where applicable) the form of prior assessment to be made by the instructor appointed to examine them.
- e) If an examination in the form of a portfolio has to be repeated, the examiner appointed for the overall evaluation and assessment will determine and put on file which individual components of the portfolio need not be repeated. These components must be resubmitted for the repeated overall evaluation and assessment.

### **5. Electronic assignments**

- a) An “e-exam” is an exam whose creation, execution and assessment (with the

exception of the open questions) are computer-assisted. An “e-exam” is admissible if it is possible to prove that the examinee masters the contents and methods of the module in important correlations and is able to apply the achieved knowledge and skills; if necessary it can be supplemented by other examination forms.

- b) The “e-exam” has to be conducted in presence of a professional qualified person (recorder). A record has to be prepared about the course of the exam, which includes at least the name of the recorder as well as of the examinees, start and end of the exam and probably particular incidents. It must be guaranteed that the electronic data can be clearly and permanently assigned to the examinees. According to the regulations of § 21 the examinees must be granted the chance to inspect the computer-assisted exam as well as the achieved result.
- c) The students must be given the opportunity before the exam to become acquainted with the examination regulations and the examination system.
- d) Examinations in form of electronic examinations have to be assessed in principle by two examiners.. This might be deviated if in case of failure of the particular module exam there is at least one possibility of repetition. The assessment is made according to § 16 para. 1
- e) In the case of an assessment by several examiners the grade of the electronic examination results of the arithmetic average of the grades given by the two examiners, The announcement of the assessment is made within 8 weeks after the examination date. Within one month after the announcement of the assessment the examinees must be given the opportunity to have access to their electronic assignments.

## 6. Multiple Choice Examinations

- a) In the case of “multiple choice examinations” the examinee shall resolve questions posed in writing under supervision by indicating the correct answers from a catalogue of given possible answers. The multiple choice procedure is used in suitable modules at the request of the examiners and with the consent of the examination board.
- b) The examination questions must be based on the knowledge and qualifications to be imparted by the module in question and enable reliable examination results to be obtained.
- c) The examiners determine the examination questions and the specified answer options (examination tasks). It must be recorded in writing which of the possible answers are accepted as the correct answer to the examination questions.
- d) The examination is passed if the examinee has answered at least 60 % of the examination questions asked correctly or if the number of questions answered correctly by the candidate is not more than 15 % lower than the average examination performance of the candidates who took the examination for the first time in the previous comparative period comprising three examination dates.
- e) The performance in the written test shall be assessed as follows: If the minimum number of correctly answered test questions required to pass the test referred to in (d) has been reached, the mark shall be as follows

excellent	(1,0)	if at least 98 %,
	(1,3)	if at least 93 % to 97 %,
good	(1,7)	if at least 89 % to 92 %,
	(2,0)	if at least 85 % to 88 %,
	(2,3)	if at least 81 % to 84 %,
satisfactory	(2,7)	if at least 77 % to 80 %,
	(3,0)	if at least 73 % to 76 %,
	(3,3)	if at least 69 % to 72 %,
passed	(3,7)	if at least 65 % to 68 %,
	(4,0)	if at least 60 % to 64 %

of the examination questions asked were answered correctly.

The grade is 'insufficient' (5,0) if the required minimum number of test questions correctly answered according to point (d) has not been reached. If the minimum pass mark deviates from 60 %, the percentage points must be adjusted proportionally.

- f) The assessment of the audit shall include the following information:
  1. the number of exam questions asked and the number of exam questions answered correctly by the candidate,
  2. the required minimum number of test questions to be answered correctly (pass mark),
  3. in the case of passing, the percentage by which the number of correctly answered questions exceeds the minimum requirements,
  4. the mark obtained by the examinee.
- g) When evaluating the examination results, the examiners must pay attention to whether, due to the accumulation of incorrect answers to certain examination questions, there are indications that the examination task was formulated incorrectly. If, following the performance of the audit, it appears that individual questions or possible answers have been formulated incorrectly, the relevant audit tasks are deemed not to have been performed. The number of examination tasks shall be reduced accordingly;

the evaluation shall be based on the reduced number of tasks. The reduction in the number of examination tasks must not be detrimental to the examinees.

#### **7. Presentation with colloquium**

- a) In examinations in the form of a presentation with colloquium, it is to be determined whether the candidate is able to work on and explain a technical or practical topic independently or to defend it argumentatively.
- b) The provisions of points 1(b) - (e) shall apply accordingly.

#### **8. Integrated exams**

- a) In integrated examinations it should be determined whether the candidate is able to solve a task corresponding to the requirements within a limited period of time and then present the result in the context of the examination area as well as to classify and answer special questions in this context.
- b) The examinee will be informed in writing of the task four weeks before the examination date in order to prepare a presentation. The integrated examination includes a free lecture followed immediately by an oral part in accordance with No. 1 letters b) - e).

#### **9. Practical examinations**

Practical examinations are used to determine whether the examinee has the necessary practical qualifications in the relevant subject area. The examination shall be designed in such a way that it covers both the practical presentation and the oral or written preparation of a paper under supervision. Clauses 1 and 2 shall apply accordingly.

### **§ 14**

#### **Credit points account and recording of credit points**

- (1) The examinations committee opens a credit points account for each candidate. The account records credit points gained and grades awarded for the module examinations and master's thesis. Students' individual performance is communicated by the examiners to the students in a form determined by the examinations committee, or communicated to the examinations committee. So far as organizationally possible, candidates can inspect their credit point accounts.
- (2) Credit points are only entered once onto the account.

### **§ 15**

#### **Master's thesis**

- (1) The master's thesis seeks to determine that candidates have mastery of their subject and are able within a set time to address a problem from that subject area independently and scientifically. Prerequisite for the issue of the topic of the master's thesis is the proof of at least 70 credit points according to § 10 as well as the successful completion of the modules "CSim1 Computer Simulation 1" and "CSim3 Computer Simulation 3" and of at least one module in the selected specialization.
- (2) The topic of the master's thesis is set by examiners appointed by the examinations committee in accordance with § 6 section 1. The thesis is supervised by these examiners. Candidates must be given an opportunity to suggest a topic for the master's thesis.
- (3) The chairperson of the examinations committee will, upon application by the candidate, ensure that a topic is set in due time, i.e. as a rule at the end of the third teaching semester.
- (4) The topic for the master's thesis is issued by the chairperson of the examinations committee. The date of issue must be put on file.
- (5) The time allotted for the master's thesis is 6 months. The topic and task must be set in such a way that the deadline can be kept. The topic can only be rejected once and only within the first 8 weeks of the allotted time. Exceptionally and in individual cases, on reasonable application by the candidate, the examinations committee can extend the allotted time by a period of up to three months.
- (6) Candidates must provide written assurance when submitting their master's thesis that they have written the thesis independently themselves, using only the sources and aids documented therein, and that they have indicated all quotations as such.
- (7) Three copies of the master's thesis must be submitted to the examinations committee within the deadline; the date of submission must be put on file. In order to check for plagiarism, an electronic

version of the thesis and of any empirical data used therein must be submitted together with the printed version, in a format to be agreed with the examinations committee, onto a data medium to be determined by the examinations committee. If the master's thesis is not submitted within the deadline, it will be deemed failed (grade 5.0) in accordance with § 8 section 1 sentence 2.

- (8)** The master's thesis must be evaluated and assessed by two examiners. One of the examiners should be the person who set the topic and supervised the thesis. The second examiner will be appointed by the chairperson of the examinations committee. The supervisor of the thesis may propose the second examiner. Each assessment must be executed in accordance with § 16 section 1, giving reasons in writing. So long as the difference between the individual grades awarded is not greater than 1.0, the grade awarded for the master's thesis will be the arithmetic mean of the grades proposed by the individual examiners. If the difference is greater than 1.0, the examinations committee will appoint a third examiner to assess the thesis. In this case the grade awarded for the master's thesis will be the arithmetic mean of the two better grades proposed. The master's thesis can, however, only be deemed "passed" or better if at least two of the grades awarded are "passed" or better. If the final grade awarded for the thesis is not at least "passed", the candidate has failed and the master's thesis must be repeated.
- (9)** The master's thesis can be repeated once. In this case candidates will be set a new topic. Rejection of the topic for the second master's thesis within the deadline named in section 5 sentence 3 is, however, only permissible if candidates have not availed themselves of this opportunity when preparing their first master's thesis.
- (10)** The assessment of the master's thesis must be communicated to candidates 8 weeks after submission of the thesis at the latest.
- (11)** The workload of the master's thesis is 30 credit points.

## **§ 16**

### **Assessment grades**

- (1)** Grades for individual elements of the examination will be awarded by the relevant examiners. The following grades are awarded:

1 = excellent	= an outstanding performance;
2 = good	= a performance considerably above average requirements;
3 = satisfactory	= a performance that meets average requirements;
4 = passed	= a performance that despite its shortcomings still meets requirements;
5 = failed	= a performance that because of serious shortcomings no longer meets requirements.

In order to achieve greater differentiation in the assessment of examination performance, intermediate grades can be awarded by raising or lowering the individual grades by a ratio of 0.3. However, the grades 0.7, 4.3, 4.7 and 5.3 are not permissible.

- (2)** Module grades are as follows:

average grade up to 1.5	= excellent;
average grade greater than 1.5 through 2.5	= good;
average grade greater than 2.5 through 3.5	= satisfactory;
average grade greater than 3.5 through 4.0	= passed;
average grade greater than 4.0	= failed.

- (3) The overall grade of the master's examination is the arithmetic mean, weighted according to credit points, of the module grades together with the grade of the master's thesis. In calculating the overall grade, only the first decimal place is taken into account; all further decimal places are ignored without rounding up or down. The overall grade of a successful master's examination is:
- |  |                 |
|--|-----------------|
| average grade up to 1.5                    | = excellent;    |
| average grade greater than 1.5 through 2.5 | = good;         |
| average grade greater than 2.5 through 3.5 | = satisfactory; |
| average grade greater than 3.5 through 4.0 | = passed.       |
- (4) If the master's thesis is assessed with the grade 1.0 and the average of all other grades of the master's examination is not worse than 1.3, the overall assessment awarded will be "passed with distinction" instead of "excellent" as in section 3.
- (5) The overall grades of successful candidates in the master's degree program in Computer Simulation in Science of the past two academic years will be displayed in a table containing the overall grades (1 through 4) awarded in the degree program, the number of candidates gaining each of these grades, and the percentage share of these grades in the overall total (ECTS grading table). In their overall grading, candidates are also awarded the following ECTS grades:
- |              |    |
|--------------|----|
| the best 10% | A  |
| the next 25% | B  |
| the next 30% | C  |
| the next 25% | D  |
| the next 10% | E. |

## § 17 Supplementary credits

- (1) Candidates can gain more credit points than the number set for the master's degree program.
- (2) Supplementary credits can be gained by successfully completing extra modules of this master's degree program. Successfully completed modules of other degree programs can only be counted as supplementary credits with the agreement of the examinations committee. Supplementary credits will be entered on the examination certificate upon application. These supplementary credit points and grades will not be counted in the calculation of the overall grade of the master's examination.

## § 18 Examination certificate

- (1) A certificate testifying to the [successfully] passed master's examination and indicating the individual module grades, the overall grade, the ECTS grading table, and the grade and topic of the master's thesis will be issued without delay and if possible within four weeks of the allocation of the final credit points. Supplementary credits (where accepted), as well as the time taken to complete the degree program up to and including the master's examination can also be indicated on the certificate upon application by the candidate. The certificate must be signed by the chairperson of the examinations committee. The certificate will be dated to the day on which the last credit points were gained.
- (2) If the master's examination is definitively failed, or deemed so, the chairperson of the examinations committee will notify the candidate of this in writing.
- (3) Notification of definitive failure of the master's examination must be accompanied by an instruction about available legal remedies.
- (4) Candidates who fail the master's examination will, upon application and submission of relevant proof, be provided with a written document that indicates their examination performance, grades, and number of examination attempts, as well as of the credit points still required to pass the master's examination, and also makes clear that they have not passed the master's examination.

**§ 19**  
**Master's degree certificate**

- (1) At the same time, and bearing the same date, as the examination certificate, candidates will be given their master's degree certificate. This formally attests the award of the master's degree in accordance with § 2.
- (2) The master's degree certificate will be signed by the dean of the Faculty of Mathematics and Natural Sciences and the chairperson of the examinations committee, and will bear the Faculty seal.
- (3) The University of Wuppertal issues a Diploma Supplement (DS) in accordance with the diploma supplement model of the European Commission, the Council of Europe, and UNESCO/CEPES. The presentation of the national educational system (DS section 8) follows the text agreed by the Standing Conference of Ministers of Education and Cultural Affairs and the University Rectors' Conference in its currently valid form. In addition to the Diploma Supplement, the University of Wuppertal will upon application by the candidate provide English translations of the examination and master's degree certificates.

**III. Further regulations**

**§ 20**  
**Invalidity of master's examination, revocation of master's degree**

- (1) If, in gaining credit points, a candidate has practiced deception that only becomes known after the certificate has been awarded, the examinations committee can retroactively correct the grades of the elements affected by the deception and declare the examination failed in whole or in part.
- (2) If, without any intent to deceive on the part of the candidate, the preconditions for gaining credit points were not fulfilled, and this only became known after the certificate had been awarded, this impairment is made good by the successful acquisition of the credit points in question. If the candidate intentionally gained admission to an examination on false pretences, the examinations committee will decide about legal consequences, taking into account the provisions of the Administrative Procedures Act of the State of North Rhine-Westphalia.
- (3) Before a decision is made, candidates affected must be given an opportunity to state their case.
- (4) The unjustified certificate must be withdrawn and if necessary a new certificate issued. A decision in accordance with section 1 and section 2, sentence 2 is excluded after five years have elapsed from the date of issue of the certificate,
- (5) If the examination as a whole is declared failed, the master's degree must be revoked and the master's degree certificate withdrawn.

**§ 21**  
**Inspection of the examination files**

After individual examinations, students may upon application inspect their examination scripts, evaluations and assessments. The application must be made within one month of the announcement of the examination results. Details are regulated by the examinations committee.

## **§ 22**

### **Transitional provisions**

These examination regulations apply for all students who enroll for the first time in the master's degree program in Computer Simulation in Science from summer semester 2014 onward.

Students who began their master's degree program under the examination regulations dated 15.07.2004 (Official Announcement 22/04), most recently amended on 17.10.2007 (Official Announcement 71/07), can take their module examinations, including the master's thesis, until 30.09.2016, unless they apply to the examinations committee to be allowed to proceed under these new examination regulations. The application to proceed under the new examination regulations is irrevocable. Repeated examinations fall under the examination regulations under which the original examination was taken.

## **Article II**

### **Übergangsbestimmungen**

These examination regulations apply to all students who are enrolled for the first time at the Bergische Universität Wuppertal for the Master's programme Computer Simulation in Science starting in the winter semester 2018/2019. Students who have commenced their studies according to the examination regulations of 19.05.2014 (Official Announcement 29/14), amended 28.03.2017 (Official Announcement 17/17) and 28.07.2017 (Official Announcement. 41/17), may take their module examinations until 30.09.2020, unless they apply to the examination board for application of these new examination regulations. The application for application of the new examination regulations is irrevocable.

## **Article III**

### **Entry into force, publication**

These examination regulations shall enter into force on the day following their publication in the Official Gazette as the promulgation sheet of the Bergische Universität Wuppertal.

Issued on the basis of the resolution of the Faculty Board of the Faculty of Mathematics and Natural Sciences of 30.01.2019.

---

Dated Wuppertal 13.03.2019

The Rector of the  
University of Wuppertal  
Professor Dr. Lambert T. Koch