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Examination Regulations for the master's degree course Computer Science of the Faculty for Electrical Engineering, Computer Engineering and Mathematics at the University of Paderborn

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Based on § 2 section 4 and § 64 section 1 of the law of the Universities of the state North–Rhine Westphalia (Higher Education Act – HEA) of September 16th 2014 (GV.NRW. p. 547), last changed by the law of December 15th 2016 (GV.NRW. p. 1154), the University of Paderborn has issued the following regulations:

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I. General Issues

§1. Purpose of the exams, aim of studies

(1) The master's exam builds a second professional university degree of the studies of Computer Science.

(2) The Master's exam shall examine whether the students have extended the necessary knowledge and deepened it in chosen areas for the work experience in a previous Bachelor study program, so they have the ability to use suitable scientific methods to solve problems in Computer Science and develop it in their chosen field of academic specialisation. To the requirements of the work experience in Computer Science also belongs the ability of communicating in English language orally and in written from in professional activities.

(3) The course of studies delivers the students not only the general aims of studies of § 58 HG the ability to use and develop scientific methods of Computer Science in their work and, concerning the effects of technological change, to act responsible.

§2. Academic degree

When the master's degree program is completed successfully, the faculty for Electrical Engineering, Computer Science and Mathematics confers the academic degree "Master of Science", abbreviated "M.Sc.".

§3. Beginning of studies

Beginning of studies is in the winter term or summer term.

§4. Licensing requirements

(1) In the Master program Computer Science can only be inscribed who cumulatively

1. Has the A–level certificate (in general or connected to a subject) or according to a legislative decree an advanced technical college certificate or one through a legal regulation or an educational qualification approved as equal by the responsible public authority or has the requirements for the qualified in a professional education or meets the requirements of the regulation of university access for foreign national with university entry qualifications.

2. Has a qualification which fulfils the following requirements:

a) It must involve a first higher education degree qualifying for entering a profession with a normal program length of at least six semesters at the University of Paderborn or a public or publicly accepted university or a state or state–approved university of cooperative education. Qualifications of a foreign state or state–approved university ensure an access, as long as regarding the gained competences there is no significant difference to a qualification of the University of Paderborn according to paragraph 1. For foreign educational attainments equivalency agreements approved by the Standing Conference of the State Ministers of Education and the Arts in the Federal Republic of Germany and the Conference of Presidents and Rectors of Universities and Other Higher Education Institutions or corresponding legal

regulations have to be taken into account. As far as agreements of the Federal Republic of Germany made with other states about the equivalency in the higher education sector (equivalence treaty) favour students from foreign states differing from paragraph 2, regulations of the equivalence treaty come first. Apart from that, in case of doubts about presence or absence of significant differences the central office for foreign education has to be consulted. The examination board makes the statement about the requirements according to paragraph 2.

c) The qualification must be made with a total grade of at least 3,0.

3. Has sufficient language skills according to paragraphs 2 and 3.

4. As a foreign prospective student who isn't on an equal footing with German according to international law attests his or her ability to study throughout the results of GRE Revised General Test. Usually at least 157 points are required in the part "Quantitative Reasoning" at least 4.0 points in the part "Analytical Writing" of the GRE Revised General Test. When there is an excellent grade in the qualification according to No. 2, the examination board can accept a lower number of points, depending on the qualification. Prospective students with a German eligibility for entry to higher education are exempted from the proof of the ability to study.

(2) To the master's degree program Computer Engineering will be admitted who

1. Has language skills in English which can be proved through transcripts or documents of

(a) A successfully completed school instruction in English language from grade 5 and a duration of at least 5 years – as developing nations – or

(b) A language test at least on the level TOEFL 500 (paper and pencil) or TOEFL 61 (Internet based) or

(c) Equivalent skills (e.g. Cambridge First Certificate (FCE) grade B or IELTS with a minimum result 5.0)

2. As a student who has acquired her or hers entry requirements not at a German facility has sufficient skills in German language. A verification of the linguistic ability to study is needed for unlimited admission or enrolment to all study programs. Details are governed by the regulations for the German language examination for enrolment at university at the University of Paderborn in the respective current version.

(3) Alternatively to paragraph 2 also someone who doesn't have the necessary German language skills, but has profound English language skills instead, which can be proved by certificates or documents of

a) A bachelor's degree in an English speaking foreign country[1] or in an English speaking, accredited, national degree program or

b) A test of English as Foreign Language (TOEFL) "Internet–based" Test (iBT) with a result of at least 80 points or

c) TOEFL "Paper–based" test (PBT) with a result of at least 550 points or

d) IELTS–test with a result of at least 6.5 or

[1] Within the frame of these regulations these are Australia, Great Britain, Ireland, Canada, New Zealand and the United States of America.

e) Cambridge Test – Certificate in Advanced English (CAE) grade B
or tests on an equivalent level.

(4) According to paragraph 3 enrolled students have to proof German language skills of the competency level A2 GER (European Frame of Reference) before completion of their master's degree. These can be acquired in German language courses and are credited with maximal 12 CP within the extracurricular studies.

(5) Enrolment is to be declined, if

1. The conditions mentioned in paragraph 1 – 3 aren't fulfilled

2. The candidate has finally failed an examination, which is essential according to the examination regulations, in the degree program wanted at an university within the scope of the basic law or

3. The candidate has finally failed an examination, which is essential according to the examination regulations, in a degree program at an university within the scope of the basic law, if the unsuccessful degree program has an essential content–related similarity to the master's degree course Computer Science at the University of Paderborn. The examination board decides about the essential content–related similarity.

§5. Prescribed period of study and extend of studies

(1) The normal program length for the master's program takes including the master's examination four semesters. Students are expected to have a total amount of work (workload) according to 120 CP (= 3 600 hours).

(2) The master's program includes modules with an overall scope of 120 CP.

(3) All students must complete modules and related examinations in the main subject with a scope of at least 24 CP in English language.

(4) If the master's degree program Computer Science is studied completely in English language, one must count with a small restriction of the freedom of choice. The same counts when only the amount of the in paragraph 3 required modules is chosen in English language.

(5) The indicated CP correspond to the points to be awarded according to the European Credit Transfer System (ECTS). One CP equals a workload of 30 hours on average. One semester usually covers 30 CP and consequently an effort of 900 hours. The content of the modules is chosen in a way in which the workload provided by the CP is taken account for.

(6) The faculty for Electrical Engineering, Computer Science and Mathematics has created an exemplary timetable and a module guide on the basis of these examination regulations. These documents give information especially about the aims of the individual modules and about the courses assigned to the modules as well as about the necessary prior knowledge and content. The exemplary timetable and the module guide are added to the examination regulations in the appendix. The module guide gives the current state of the point in time of the passing of the resolution about the examination regulations. The module guide is updated on a regular basis and is published on the website of the Institute of Computer Science.

(7) In the master's program for the extracurricular studies and an optional subsidiary together a scope of 12 LP is provided. Examinations have to be taken in the optional subsidiary in terms of § 15. In the extracurricular studies a performance in examination has to be taken into a chosen course. In courses of extracurricular studies in which no performance in examinations has to be taken a proof of a qualified participation has to be made.

§6. Modules

(1) The master's degree program Computer Engineering is offered in a modularised form. Modules are thematically and temporally rounded, concluded in themselves and equipped with credit points, independent units of qualification, which can be examined. The modules have a scope of 5 to 30 CP and can usually be completed within one to two semesters.

(2) Besides the project group modules (20 CP) and thesis submitted for the master's degree (30 CP) as well as besides the extracurricular studies and subsidiaries (altogether 12 CP) the master's degree is structured into eight compulsory elective modules (6 CP each) and two seminars (5 CP each).

(3) A module may contain compulsory and compulsory elective courses. If a module contains compulsory options, these are chosen from a course catalogue, which is part of the module description.

§7. Accreditation of achievements

(1) Achievements which have been rendered in other degree programs or in degree programs at other state or state–approved universities, at state or state–approved colleges of cooperative education or in degree programs at foreign state or stately accepted universities are accepted on application, as long as concerning the gained competences there is no major difference compared to the achievements which will be replaced. Not a schematic comparison has to be made, but an overall consideration regarding the accreditation purpose of the continuation of studies and taking exams. Paragraphs 1 and 2 count for the accreditation of achievements made via stately accepted distance learning or for distance learning units created by the state North Rhine–Westphalia in this context with other states and the federal government.

(2) For the accreditation of achievements at foreign universities the equivalency agreements made by the Standing Conference of the State Ministers of Education and the Arts in the Federal Republic of Germany and the Conference of Presidents and Rectors of Universities and Other Higher Education Institutions as well as the agreements within the university partnerships have to be kept in mind. Insofar agreements of the Federal Republic of Germany have been made with other states in the higher education sector (equivalency agreements) favouring students of foreign states differing from paragraph 1 regulations of the equivalency agreements come first. Otherwise when there are doubts about presence or absence of significant differences one has to obey the central office for foreign education.

(3) The exmanination board has to place a student on the student's request into a semester on the basis of accreditation according to paragraph 1.

(4) Knowledge and skills proven in the entrance examination of prospective students, who are qualified to begin their studies on the basis of an entrance examination according to § 49 paragraph 12 HG, will be accepted. For the examination board it is obligatory to note down the entrance examination in the certificate.

(5) Other skills and qualifications can be accepted on application by the examination board on the basis of submitted documents, if those skills and qualifications are equivalent in content and level to the achievements which are supposed to be replaced.

(6) The examination board is responsible for accreditations according to paragraphs 1 and 5. Before assessment about presence or abscence of significant differences or of equivalence responsible expert representatives have to be consulted. A denial of the assessment is to be explained.
(7) The applicant has to submit the information needed for accreditation (especially knowledge and skills gained through achievements and examination results) in a form determined by the examination board. The examination board has to decide about applications according to paragraph 1 within ten weeks the latest after a complete submission of all relevant information.

(8) The accreditation will be marked in the certificate. When achievements are accredited grades have to be taken over after a conversion, if necessary, and to be taken into the respective grade calculation, as far as the grading systems are comparable. If there is no grade or if the grading systems aren't comparable, the note "passed" is chosen.

(9) An achievement can only be approved once. This also counts for assessment of other knowledge and qualifications.

II. Organisation of the Examinations

§8. Examination Board

(1) The faculty executive committee of the faculty for Electrical Engineering, Computer Science and Mathematics builds an examination board for the mater's degree course Computer Science. The responsibility lies in

– The organisation of examinations and the supervision of its implementation.
– The compliance of the examination regulations and the consideration the procedure regulations made for implementation of the examinations.
– The decisions about contradictions against decisions made in the assessment procedure,
– The writing of an annual report to the faculty executive committee about the development of the examinations and the time to degree,
– Other tasks explicitly assigned to the examination board by these regulations.

The chairperson of the examination board is assigned certain tasks by these regulations. Furthermore the examination board can assign the completion of matters, which don't have any fundamental meaning, to the chairperson; this doesn't count for decisions about contradictions and reports meant for the faculty executive committee. The chairperson tells the examination board about decisions made by her or him alone. The examination board and the chairperson of the examination board are supported by the central examination office.

(2) The examination board consists of two chairpersons, the representative chairperson and five other members. On the suggestion of the individual group the chairpersons, the representative chairpersons and two more members out of the group of professors, one member out of the group of academic employees and two members from the students group by their respective representative of the faculty executive committee. Representatives are chosen for the members of the examination board except for the chair person and the representative chair person. The term of office of the members from the

professors group and the members of the academic employees takes two years and goes from October 01st of the election year until September 30th of the next but one year. The term of office of students takes one year and goes from October 01st of the elective year until September 30th of the next but one year. A re–election is allowed. The regulations of gender equality according to § 11c HG have to be taken into account.

(3) The examination board is the authority in the sense of administrative procedures and administrative procedural law.

(4) The examination board is quorate when besides the chairperson or the representative chairperson and two more professors at least one more voting members is present. The examination board decides with simple majority. In case of a tie vote the vote chairperson counts. The student members of the examination board have only an advising voice in case of educational–scientific decisions, especially while assessing or accepting performances.

(5) The examination board is summoned by the chairperson. The convocation must be made when at least three members aks for it.

(6) The sessions of the examination board are not public. The members of the examination board, its representatives, examiners and assessors underlie official secrecy. As long as they are not in public service, they are not obliged to secrecy by the chairperson of the examination board.

(7) The members of the examination board have the right to attend the acceptance of examinations.

§9. Examiners and assessors

(1) The chairperson of the examination board requests the examiners and assessors. Examiners are all independent professors of courses in which according to the curriculum and the module descriptions performances in examinations can be made. As an assessor can only be requested someone who has at least made the corresponding master's examination or a comparable examination.

(2) Examiners are independent in their audit activity.

(3) The candidate can suggest examiners for the thesis and for the oral exam, if there are several to chose from. Suggestions shall be taken into account if necessary. There is no legal claim.

(4) The examination board assures that candidate receives the names of the examiners on time, usually four, at least two weeks before the date of the examination. The announcement in the Campus Management System of the Unviversity of Paderborn is sufficient.

III. Master's Examination

§10. Aim, word limit and style of Master's Examination

(1) The master's examination extends over the following so–called Focus Areas

1. Software Engineering
2. Algorithm Design

3. Networks and Communication
4. Computer Systems
5. Intelligence Data

One of these five Focus Areas has to be chosen as Specialization Area.

(2) As standard subjects can be chosen

1. Electrical Engineering
2. Mathematics
3. Media Studies
4. Philosophy
5. Psychology
6. Business Information Technology
7. Economics

For subsidiaries exists an agreement about the subsidiary for each with a matched module offer; the agreements about the subsidiary are contained in the appendix of these regulations. The schedules are coordinated during the process of creating the university calendar.

A sufficient offer completely in English language is guaranteed in the subsidiaries Electrical Engineering and Business Informatio Technology.

On application the examination board can permit in an individual case an other subject as a subsidiary. In this case he decides about performances in examination which have to be made and informs the applicant about these.

(3) The master's examination consists of

1. Three study–related module examinations in compulsory elective modules with a scope of 6 CP each in the Specialization Area,
2. A study–related module examination in a compulsory elective module and in one of the Focus Areas differnetiated in Specialization Area with a scope of 6 CP,
3. Four study–related module examinations in compulsory elective modules with a scope of 6 CP each out of optionally selectable Focus Areas,
4. The project group module (20 CP),
5. Two seminar modules (5 CP each),
6. The Master's dissertation module (30 CP) including work scheduling (5 CP), a presentation of a duration of circa 45 minutes,
7. Examinations in an optional subsidiary or an examination within the module "extracurricular studies" with a scope of at least 12 CP in total.

(4) Modules and related examinations in the main subject with a scope of at least 24 CP must be completed in English language. In the course of these regulations it means that lectures and examinations must be held in English language.

(5) The certificate about the completion of "Master's program Computer Science" according to § 2 section 2 will be made out when

1. The examination has been made completely in English language according to paragraph 3 nº 6 (Master's dissertation module) and

2. Such have been made according to paragraph 3 nº 1 to 5 (compulsory elective modules), except modules and examination with a scope of maximum 18 CP according to the form described in paragraph 4.

(6) In the optional subsidiary module examinations with a scope of 12 CP have to be made. Alternatively extracurricular studies with a scope of 12 CP have to be completed. In this case in one course chosen in the extracurricular studies a performance in examination has to be made. In courses within the extracurricular studies, in which no performances in examination have to be made, a proof of the qualified participation has to be performed. More details regarding the standard subsidiaries are provided in appendix 2. In case of admission according to § 4, paragraph 3 the necessary German language courses can be approved as examinations in the extracurricular studies according to paragraph 3 nº 5. It is not allowed to complete courses for Computer Science in the extracurricular studies. The examination board decides about exceptions.

§11. Admission to the Master's Examination

(1) Those who are enrolled in the master's program Computer Science at the University of Paderborn or are permitted as visiting student according to § 52 HG will be permitted to examinations in the master's program Computer Science. During examinations these requirements must be existent.

(2) According to the available capacities and on application at the examination board students of the bachelor's degree course Computer Science, who have gained at least 152 CP relevant for graduating in their bachelor's degree program and have registered the bachelor's thesis, can beyond paragraph 1 be permitted to modules of a master's degree with a scope of maximum 30 CP for one semester. The project group module is excluded from that. The regulations can only be used once. A repetition of a failed pulled forward master's examination is only possible after the enrolment in the master's program Computer Science. Students don't any claim on receiving an access to the master's program Computer Science to a later point in time.

(3) Those who have successfully completed modules with the scope of 48 CP (at least 18 CP of them in the chosen Specialization Area) can be admitted to the master's thesis module. In case of enrolment with restrictions according to § 4 in addition passing the related examinations must be proved. The announcement of the topic of the master's thesis is made by the chairperson of the examination board right after acceptance of the work plan the noted down in writing by the mentor. The date of the announcement has to be made on record at the central examination office.

(4) The notification concerning the Master's thesis has to be provided in writing to the chairperson via the central examination office. When providing the notification about the Master's thesis the language in which the Master's thesis will be written has to be indicated.

(5) The admission to an examination has to be declined when the requirements stated in paragraphs 1 and 3 are not fulfilled.

(6) As a subsidiary usually a subject studied during the first degree has to be chosen; the examination boad decides about exceptions. The determination about the subsidiary takes place with the explicit registration as a subsidiary examination and taking of the first examination in this subject. Non–appearance or withdrawal without good reasons according to § 22 is equal to taking an examination.

The candidate registers her or his participation in an examination in the subsidiary at the examination board in each case not lat than two weeks before the date of the examination.

§12. Enrolment and registration deadline

(1) For each module a separate registration in the Campus Management System is necessary. Additionally for every examination a separate notification in the Campus Management System with the set time periods is necessary. The deadlines of the application phase for examinations will be announced on the respective information page of the Campus Management System.

(2) The registration for the oral examination according to § 13, paragraph 2, for which an examination block is established, are made within determined time periods, meanwhile the individual examinations are taking place (comprehensive examination). The registration for examinations according to § 13, paragraph 2, which are offered as oral examinations without a specification of an examination block (Individual examinations), is made within the determined time periods in the Campus Management System. The examiner gives the concrete date for the examination. Professors schedule the application dates for the project groups and the seminars before the time period for the registration for examinations.

(3) Examinations can be taken as soon as the necessary requirements for admission set in § 11 are fulfilled the candidate has registered oneself according to paragraphs 1 and 2 and has been permitted.

(4) In modules of the chosen subsidiaries in case of registration, cancellation and withdrawal regulations of the individual relevant examination regulations of the offered subject will be applied. For modules of the extracurricular studies in case of registration, cancellation, withdrawal, examination offence, compliance and assessment of the performances in examination the regulations of these examination regulations will be applied.

§13. Completion of a module

(1) Every module is completed by a module examination. The module examination takes place in temporal connection with the module. A module examination usually consists of a Module Exam (*Modulabschlussprüfung*) in the end of a module. The module examination can also consist of several sub–module examinations (*Modulteilprüfungen*). If a module consists of several partial examinations, every partial examination has to be passed. The module grade is equivalent to the grade achieved in the module examination.

(2) Credit points can only be acquired when the module has been successfully completed. A module is successfully completed when all module exams or all sub–module examinations have been assessed with at least "satisfactory" and the possibly required qualified participation has been approved.

§14. Examination performances in modules

(1) In modules performances in examination are taken according to the module descriptions. The grades of the module examinations flow into the final grade.

(2) As long as the module descriptions contain framework specifications about the form and / or duration / scope of the performances in examination, the examination board sets in consultation with the

examiner(s) how the performances in examinations have to be taken correctly. In all modules respective professors announce not later than three weeks after the beginnning of the term how performances in examination can be rendered. This counts in accordance with the proof of the qualified participation and coursework credits completed. The performances in examinations relate in each case to the content and competences of the related courses.

(3) All examinations are taken along with the studies. The examinations usually take place only twice during an academic year. The repeat usually takes place in the same semester, not later than after six months.

§15. Forms of performance in examinations in modules, study performances and qualified participation

(1) Performances in examination can be made in form of oral examinations or in another form. Usually the assessment has to be announced to the students, except for oral examinations, not later than six weeks after the performance in the Campus Management System of the University of Paderborn.

1. Oral Examinations:

– In the oral examinations the candidate has to proof that she or he recognizes correlations and is able to rank specific questions into these correlations. Furthermore the oral examination shall proof that the candidate disposes a wide knowledge about scientific methods in Computer Science.

– Oral examinations are performed in front of two examiners or in front of one examiner in presence of a competent assessor according to § 9. § 20, paragraph 5 remains untouched. Before the determination of the grade the examiners consult with one another or the examiner gathers the assessor's opinion in absence of the candidate.

– Oral examinations usually take at least 25 minutes and not more than 50 minutes. In case of group examinations the time given can be extended adequately.

– Significant subjects and results of the oral examination have to be documented in a protocol. The examiner has to communicate the result of the examination to the candidate subsequently to the oral examination.

– Students, who want to take the same oral examination at a later examination date, are permitted according to spatial conditions, as long as a candidate doesn't disagree. The admission doesn't cover the consultation about the examination result and its announcement.

2. Performance in examination in a seminar:

In a seminar a 45 to 60 minutes long presentation is and a written draft is prepared.

3. Performance in examination in the project group module:

In the project group module the successful editing of a project has to be proven by the submission of software and documentation, which counts as a phase–related examination. A grade is given for the total amount of edited projects.

(2) The qualified participation is usually proved through a research paper about an internship, followed by a conversation. A qualified participation is present only when the rendered performances indicate that the subjects have been dealt with more than just superficially.

(3) Excercises which are usually provided as homework and/or attendance tasks on a weekly basis can be required as a coursework.

(4) In the extracurricular studies oral or written performances in examination are rendered. These are usually a sit–down examination (maximum four hours), a term paper (maximum 25 pages) or an oral examination (maximum 45 minutes).

§16 Evaluation of performances in modules

(1) The respective examiner determines the grades for the individual performances in examination. For the assessment of the performances in examination the following grades have to be used:

1 = very good: an excellent performance
2 = good: a performance, which lies significantly above the average requirements
3 = satisfactory: a performance, which meets the average requirements
4 = sufficient: a performance, which meets the requirements despite its deficiencies
5 = imperfect: a performance, which doesn't meet the requirements due to significant deficiencies

(2) For a differentiated assessment interim values can be built by lowering or rising of the individual grades at 0,3. Interim grades 0,7; 4,3; 4,7 and 5,3 are excluded.

(3) If a performance in examination is assessed by several examiners, the grade is built from the arithmetic mean of the individual grades. Incidentally paragraph 4, section 2 and 3 count accordingly.

(4) If a module grade is built from several grades, the arithmetic mean has to be build. Thereof deviations are regulated in the module descriptions. The result has to be cut after the first decimal after the comma. The grade is:

At an average of including 1,5 = very good,
At an average of above 1,5 until including 2,5 = good,
At an average of above 2,5 until including 3,5 = satisfactory,
At an average of above 3,5 until including 4,0 = sufficient,
At an average of above 4,0 until 5,0 = imperfect.

(5) In addition to the performances in examination performances within the bonus system (bonus) can be made voluntarily, which is assessed and can improve the module grade according to a determined principle. The bonus is made along the studies and exclusively in relation with a concrete course. As forms of performance homework, short lectures or project works are allowed. The bonus shall step by step prepare students for following performances in examination. The examination board decides in consultation with the respective professors whether a bonus can be performed in a course or the possible code contributes to the improvement of the module grade and the respective professor announces it not later than in the third week after the beginning of the course. The module examination has to be passed independently from the bonus. The bonus can improve a module grade maximally about 0,7.

(6) Course works are assessed with "passed" or "not passed".

(7) Qualified participations have to be proved.

§17 Thesis

(1) The Master's thesis module (30 CP) consists of work planning (5 CP) and the master's thesis including a presentation (25 CP). The topic has to be chosen from the specialisation area.

(2) The master's thesis is an auditing work, which includes a scientific training and shall show that the candidate has the ability to process a task with the field of Computer Science within a certain deadline and according to scientific methods. The task has to be made in a way in which it equals a workload of five months full–time work. The work has to be submitted five months after the issue. The thesis usually doesn't have to be longer than 120 DIN A4 pages.

(3) The master's thesis is given and supervised by a person with inspector qualifications chosen by the chairperson of the examination board according to § 9. On application of the candidate the examination board can permit an examiner who represent the subsidiary chosen by the candidate to mentor of the master's thesis. In this case the examination board designates a second examiner from the field of Computer Science with whom the work plan has to be adjusted. The candidate has to be given the chance to make suggestions for the topic of the master's thesis; but this doesn't justify a legal claim.

(4) On application the chairperson of the examination board ensures that the candidate receives the topic of the master's thesis on time. The point in time of the assignment has to be made on record.

(5) The master's thesis can also be permitted in form of a group work, when the contribution of each candidate which will be counted as a performance in examination is clearly distinguishable and assessable according to the indication of paragraphs, page numbers or other, objective criteria, which enable an explicit distinction, and fulfils the requirements according to paragraph 2.

(6) The topic and the task of the master's thesis are communicated to the candidate in writing. The topic can only be returned once and within the first six months after the issue. If the topic of the master's thesis is returned after this period of time, the master's thesis counts as failed. The time allowed for the completion begins once again with the assignment of the new topic, after the acceptance of the new work plan. Exceptionally and in individual cases the examination board can extend the time allowed for the completion for six weeks based on an explained application which has to be provided at the examination board not later than one week before the expiration of the deadline, the time allowed for completion can be extended up to six weeks when the reasons for it a related with the topic of the thesis and the mentor supports it according to paragraph 3.

(7) In case of illness within the time allowed for completion the candidate can extend the deadline on application on not longer than four weeks. In addition the immediate submission of a medical certificate is necessary. A medical certificate about the existence of the inability of taking an examination suffice. If there are sufficient acutal indications which let seem an inability of taking an examination as probable or another proof as appropriate, a medical certificate of a medical officer of the University of Paderborn can be requested at the cost of the university. If the examination board grants the application, it will be communicated to the candidate in writing. The extension is equivalent to the disease duration; it doesn't entail an extension of the normal program length. If the duration of the illness extends four weeks, the candidate may choose to end the deadline for the thesis which has been extended for four weeks or request a new topic. If the examination board rejects the request, it will be communicated to the candidate in writing.

(8) The work plan has to contain the following elements: description of the task which has to be worked on, motivation of the thesis, explicit formulation of the target setting, description of the tasks that have to

be carried out in order to reach the goal, including a related schedule as well as a setting up of a provisional structure of a written elaboaration.

(9) It isn't allowed to having used the master's thesis, not even in extracts, for another completed examination.

(10) When submitting the master's thesis the candidate has to reasure in writing that she or he has written the thesis, in case of a group work the relevant marked part of the thesis, independently and didn't use any other sources as aid as those indicated as well as has marked the quotes. The work plan has to be submitted with the thesis.

§18. Acceptance and Assessment of the Master's Thesis

(1) The master's thesis has to be submitted to the central examination office on time and in two copies (typewritten, tied and paginated) as well as it has additionally be sent once in electronic form via a physical medium; the moment of submission has to be made on record. When delivering the thesis via mail the moment of the delivery at the post office (postmark) is decisive. If the master's thesis isn't submitted within the stipulated period, it has to be assessed with "imperfect" (5,0.)

(2) The master's thesis has to be assessed by two examiners according to § 9. The 45 minutes long presentation of the student forms part of the assessment. It takes places not later than four weeks after submission time. The person who has provided the topic has to be one of the examiner. The chair person of the examination board choses the second examiner. The candidate has a right of proposal. This doesn't justify a legal claim. The individual assessment has to be made according to to the § 16, paragraphs 1 to 3 and has to be explained in writing. The grade for the thesis is built out of the arithmetic mean of the individual grades, as long as the difference is not bigger than 1,0 and each of the grades of the individual assessments are at least "sufficient". If the difference is bigger than 1,0 or if the assessment "imperfect", but the others are at least "sufficient", the examination board decides about the third examiner for the assessment of the master's thesis. In this case the grade of the thesis are built out of the arithmetic mean of the three grades. The thesis can only be assessed as "sufficient" or better when at least two grades are "sufficient" or better.

(3) The grade of the master's thesis is at the same time the grade of the master's thesis module.

(4) The assessment of the master's thesis usually has to be communicated to the students not later than six weeks after the submission of the master's thesis in the Campus Management System of the University of Paderborn.

§19. Assessment of the Master's thesis and building the final grade

(1) The master's examination is passed when all module examinations and the master's thesis are at least assessed with "sufficient" (4,0).

(2) The overall grade is built by weighting all module grades according to credit points. Differing from the CP determined in § 10, paragraph 3 the project work module is weighted with 8 weight points, the master's final thesis module with 50 weighted points and the extracurricular studies module with 4 weighting points.
When calculation the results only the first decimal after the comma is taken into account, all other digits are deleted without rounding.

The grade is:
At an average of including 1,5 = very good
At an average of above 1,5 until including 2,5 = good
At an average of above 2,5 until including 3,5 = satisfactory
At an average of above 3,5 until including 4,0 = sufficient
At an average of above 4,0 unil 5,0 = imperfect

(3) The overall judgement "passed with excellence" is given when the overall grade is 1,3 or better.

§20. Repetition of examinations, compensation

(1) Passed examinations can't be repeated.

(2) Every failed module examination can be repeated twice.

(3) A passed examination, which can be entered in the books as an additional performance according to § 21, can be exchanged for a passed or a not yet or finally failed examination (compensation), as long as these can be entered in the books according to the principals, if the candidate requests it.

(4) A module counts as failed when a module examination or a sub–module examination can't be repeated or compensated accoring to paragraph 3.

(5) Resits for which there is no possibility for compensation have to be assessed by at least two examiners according to § 9.

(6) If the master's thesis module has been assessed with the grade "imperfect" (5,0), it can be repeated once. Then a new topic has to be given. A second resit is excluded. A restitution of the topic of the master's thesis according to the deadline listed in § 27, paragraph 6, section 2 is only permitted when this possibility wasn't used during the first attempt.

(7) The candidate can suggest another examiner for the resit of the master's thesis. This doesn't justify a legal claim.

§21. Additional modules

(1) Besides performances required in § 10 students can render performances in modules with a scope of up to 18 CP. Regulations for modules limited on the number of participants according § 59 HG remain untouched. Successfully completed modules are documented in the "Transcript of Records", unless the student requests to not list those modules after the submission of the thesis. Those won't be taken into account when building the grade for the master's examination.

(2) Under consideration of the indicated limit mentioned in paragraph 1 the change for the purpose of a compensation according to § 20, paragraph 3 is possibile. Failed examinations also fall under the limit.

(3) Additional modules have to be marked as such during the registration.

§22. Withdrawal, cheating, infringement of regulation and students with family duties

(1) A deregistration from examinations can be made not later than until a week before the respective examination date and without giving reasons. A deregistration from individual examinations can be made until a week before the respective examination date at the latest via the Campus Management System without giving reasons. A deregistration from comprehensive examinations according to section 1 can only be made until a week before the start of this examination block at the latest. Deregistration dates for the project group and seminars are set by the professions before the start of the registration phase.

(2) A performance in examination has to be assessed with "imperfect" (5,0) when the candidate doesn't appear at an examination date without good reasons or withdraw from an examination after the beginning of an examination without good reasons or withdraws from the examination after the end of the deregistration deadline according to paragraph 3 without giving good reasons. The same counts when the written performance in examination is not completed within the given time allowed for completion.

(3) Reasons made effective for the misprision or withdrawal have to be displayed in writing and made credible to the examination board immediately and not later than five workdays after the respective examination date. In case of illness of the candidate a medical certificate about the existence of inability of taking examination dated on not later than the day before the examination suffices. If sufficient actual indications exist, which let assume an inability to take an examination as probable or let a proof seem appropriate, a medical certificate of an independent medical officer of the University of Paderborn at the expense of the university. The illness of the child proven by a medical certificate according to § 25, paragraph 5 of the Federal Law on Support for Education and Training counts as the candidate's inability of taking an examination when the mentoring can't be granted in a different manner, especially in case of mainly sole care. If the examination board accepts the reasons, it will be communicated to the candidate in writing and a new examination date is set. Examination results which are already set have to be accredited in this case. If the examination board doesn't recognise the reasons, it will be comunicated to the candidate in writing.

(4) If a candidate deceives or she or he tries to deceive, the concerning examination has to be assessed with "imperfect" (5,0). If a candidate carries a not allowed aid along, the concerning examination has to be assessed with "imperfect". The respective invigilator documents the incidents. The respective examiner makes the determination according to section 1 or the decision according to section 2.

(5) A candidate who disturbs the proper procedure of the examination can be excluded from the contiunation of the examination by the respective examiner, usually after a warning; in this case the respective performance in examination has to be graded with "imperfect" (5,0). The reasons for the exclusion have to be made on record.

(6) In serious cases of deception or disturbance the examination board can exclude the candidate from other performances in examination. Furthermore acts of deception can be punished with a fine of up to 50.000 € according to § 63, paragraph 5 HG and can lead to deregistration.

(7) The candidate can demand within 14 days that the examination board checks the decisions according to paragraph 4, sections 1 and 2 and paragraph 5. Onerous decisions of the examination board have to be communicated to the candidate immediately in writing, explained and provided with a legal remedy instruction. Before making the decision the candidate has to be given the chance for fair hearing.

(8) Furthermore the examination board regulates the compensation for disability for students with a disability or a chronic disease. If the student is not able to take performances completely or partially according to the forseen modalities due to her or his disability or chronic disease, shall receive a compensation for disability. As a compensation for disability especially granting of organizational measures and aid, extension of the time allowed for completion or the granting of other, equivalent form of taking a performance come into question. The disability or chronic disease has to be made credible. Additionally a medical certificate or a psychological report can be requested. The application shall name and explain the desired modification. On application of the student or the examination board in consultation with the student the commissioner of the students with a disability or chronic disease can issue recommendations for the design of the compensation for disability.

(9) It is taken account of the special situation of students with family duties during their studies and during taking performances. This takes place inter alia in the following forms:

a. On application of a candidate the safeguards accordning to §§ 3, 4, 6 and 8 of the Maternity Protection Act have to be taken into account accordingly. The required proofes have to be added to the application. The examination board may determine other forms of taking examinations in consideration of the individual case. The deadlines for maternity leave interrupt every deadline according to these examination regulations; the duration of the maternity leave is not taken into the deadline.

b. Also the deadlines of the parental leave according to the respectively applicable Parental Benefit Act and Parental Leave Act have to be taken into account. The candidate has to inform the examination board in writing and include relating documents not later than four weeks before the date when she or he wants to step into the parental leave, for which period of time she or he wants to make use of the parental leave. The examination board examines if legal requirements exist, which would cause a claim for parental leave according to the Parental Benefit Act and Parental Leave Act for an employee and sets new dates and deadlines under consideration of an individual case. The submission deadline of the master's thesis can be extended on not longer than twice of the forseen time allowed for completion. Otherwise the set thesis counts as not assigned and the candidate receives a new topic after expiration of the parental leave.

c. On application the examination board takes downtimes caused by care and education of children into account according to § 25, paragraph 5 of the Federal Law on Support for Education and Training and downtimes caused by care of the spouse, the registered life partner, the partner of a marriage–like community or a relative in straight line or relative by marriage in first degree and determines deadlines and dates under consideration of the individual case. Apart from that sections 4 and 5 starting from letter b) count accordingly.

§23. Completion of studies, final failure

(1) The studies are successfully completed when the master's examination is passed and all modules have been completed successfully. The master's examination is passed when all module examinations as well as examinations in the optional subsidiary or in extracurricular studies have been assessed at least with the grade "sufficient" (4,0).

(2) The master's examination counts as finally failed when a module has been finally failed or the master thesis module has been assessed with the grade "imperfect" for a second time.

(3) The chairperson of the examination board communicates the notification about a finally failed master's examination to the candidate in writing. The notification has to be provided with an instruction of a legal remedy.

(4) If the candidate has finally failed the master's examination, she or he will receive a testimonial on application which contains gained credit points if necessary and shows that the master's examination has been finally failed.

(5) Students who leave the university without a degree for other reasons has to receive a testimonial on application after the deregistration which contains the rendered performances and gained credit points if necessary.

§24. Certificate, Transcript of Records and Diploma Supplement

(1) If the candidate has successfully completed her or his studies, she or he receives a certificate about the result. That certificate contains the name of the program, the Specialization Area, the normal program length and the final grade. That certificate contains a date on which the last performance in examination has been taken. Besides it contains the date on which the certified copy has been made. The chairperson of the examination board has to sign the certificate.

(2) The candidate also receives a Transcript of Records, which holds all taken performances and the duration of the degree program. The Transcript of Records contains information about the credit points and grades of completed modules and about the master's thesis. Furthermore it contains the topic of the master's thesis and the final grade of the master's examination.

(3) The graduate receives a Diploma Supplement together with the certificate.

(4) The Diploma Supplement is a certificate supplement in English and German language and with according indications about the german university degrees which explain the german education system and makes the classification of the respective degree. The Diploma Supplement informs about the completed degree program and the academic an d professional qualifications gained with the degree. It contains the significant content which is related with the degree, the course of studies, competences gained with the degree as well as the awarding university.

(5) If performances in examination have been completed in English language sufficiently according to § 10, paragraph 5, the degree "Master Degree Course Computer Engineering in English" is documented on the certificate and the Transcript of Records.

§25. Masters degree certificate

(1) Along with the certificate for the past master's degree the candidate receives the master's certificate with the date of the certificate. There the award of the master's degree according to § 2 is documented.

(2) The chairperson and the dean of the faculty for Electrical Engineering, Computer Science and Mathematics sign the master's certificate and provided with the seal of the University of Paderborn.

(3) A translation into english is added to the master's certificate.

§26. Inspection of examination files

(1) A candidate receives the possibility to have an insight into her or his performances in examination and the related assessments of the examiners after the announcement of the grades. The examiner desides about place and time of the insight and announces it in an appprorpiate form.

(2) As long as paragraph 1 isn't applied and on application the candidate is permitted an insight into her or his written performances in examination, the related assessments of the examiners and the examination protocols. Within one year after handing out the certificate the candidate will be permitted an insight into the master's thesis, the related report of the examiners and the examination protocols. The chairperson of the examination board decides about place and time of taking the insight; she or he can delegate these taks to the examiners.

IV. Final Regulations

§27. Invalidity of Master's Examination

(1) If the candidate has deceived during an examination and this fact becomes known after the delivery of the certificate, the examination board can subsequently correct the grades of those performances in examination where the candidate has deceived and declare the examination as entirely or partly failed.

(2) If the requirements for the admission to an examination were not fulfiled, without the candidate intending an examination offence, and it only transpires after the delivery of the certificate, this deficiency is healed by passing the examination. If the candidate has obtained the admission deliberately unjustly, the examination board decides about the legal consequences under consideration of the Adminestrative Procedure Act of the state North–Rhine Westphalia.

(3) Bevor taking a decision the affected person has to be given the chance to give a statement.

(4) The false certificate has to be taken back and a new one hast to be handed out if necessary. A decision according to paragraph 1 and paragraph 2, section 2 is excluded after the end of a deadline of five years after the issue of the examination certificate.

(5) If the examination has been declared for failed, the master's degree has to be denied and the according certificate has to be collected. The deprivation of the master's degree is only permitted within the five years since the moment of the award of the degree.

§28. Coming into effect and publication

The master's degree can be denied when it subsequently turns out that it has been acquired by deception or when the significant requirements for the award have been seen as erroneous. The examination board decides with two third of its members about the withdrawal. For the withdrawal is only allowed within five years since the moment of the award of the degree.

§29. Transition Regulations

(1) These examination regulations count for all students who have been enrolled for the first time starting from the winter term 2017/18 for the master's degree course Computer Science of the faculty for Electrical Engineering, Computer Science and Mathematics ant the University of Paderborn.

(2) Students who have been enrolled at the University of Paderborn for the master's degree course Computer Science before the winter term 2017/18 can take their master's examination including the resits in the summer term of 2020 for the last time according to the examination regulations in the edition from February 28th 2013 (AM.Uni.Pb 11.13), changed by the rules from January 29th 2016 (AM.Uni.Pb 06.16). Stricter deadlines from older transitional provisions remain untouched. Starting from winter term 2020/2021 the master's examination including the resits can be taken according to these examination regulations.

(3) On application students can change into these examination regulations. The change is irrevocable.

§30. Date of effectiveness and publication

1) The examination regulations come into force with effect from October 01st 2017. At the same time the Master's examination regulations from February 28th 2013 (AM.Uni.Pb 11.13), changed by the rules from January 29th 2016 (AM.Uni.Pb 06.16) cease to be in force. § 29 remains untouched.

(2) The examination regulations are published in the Official Communications of the University of Paderborn (AM.Uni.Pb.).

Issued due to the resolution of the faculty executive committee of the faculty for Electrical Engineering, Computer Science and Mathematics April 24th 2017 and the legality audit by the President's cabinet of the University of Paderborn from Mai 17th 2017.

Paderborn, June 16th 2017

For the President
The Vice president for economic administration personnel management
Of the University of Paderborn

Simone Probst

Appendix 1: Modules and Forms of Examinations

As a consequence of the research and teaching content of the institute for Computer Science and for Electrical Engineering and Information Engineering can be omitted or replaced in small number in the compulsory elective area modules of the following list or by modules which professionally belong to the same area. Changes are announced in the module guide. Regulations of performances, about scope as well as requirements for participation remain untouched from it.

Focus Area Module	**LP Modules** SWS	**Forms of Examinations**	**Notes**
Software Engineering	**6**	Oral examination as final module examination	Compulsory elective module
One of the modules • Advances Compiler Construction • Advanced Software Engineering: Methods, Architectures, Industrial Applications • Build It, Break It, Fix It • Compiler Construction • Deductive Verification • Designing code analyses for large–scale software systems • Empiric Performance Evaluation • Fundamentals of Model–Driven Engineering • High–Performance Computing • Contextual Computer Science • Language–Based Security • Logic Programming for Artificial Intelligence • Model Checking • Model–Based Interface Development • Software Analysis • Software Quality Assurance • Type Systems for Correctness and Security • Usability Engineering Practice Deductive	3+2		**In case of enrolment under conditions** with courses with restrictions Basics in Human–Machine–Interaction **Software Engineering 1 and 2** Passing of the according examination and the registration of the module have to be proven. Requirement for participation in the module examination: coursework

Algorithm Design One of the modules • Advanced Algorithms • Advanced Complexity Theory • Advanced Distributed Algorithms and Data Structures • Algorithmic Game Theory • Algorithms for Highly Complex Virtual Scenes • Clustering Algorithms • Computational Geometry • Foundations of Cryptography • Linear and Integer Optimization • Public–Key Cryptography • Routing and Data Management in Networks	**6** 3+2	Oral examination as final module examination	Compulsory Elective Module In case of enrolment under conditions with courses with restrictions **Mathematics 1 and 2** **Models and Algorithms 1 and 2** Passing of the according examination and the registration of the module have to be proven. Requirement for participation in the module examination: coursework
Networks and Communication One of the modules • Advanced Distributed Algorithms and Data Structures • Bitcoins, Cryptocurrencies, and Privacy–Enhancing Technologies • Empiric Performance Evaluation • Future Internet • Mobile Communication • Network Simulation • Networked Embedded Systems • Routing and Data Management in Networks • Vehicular Networking	**6** 3+2	Module examination as final module examination	Compulsory Elective Module In case of enrolment under conditions with courses with restrictions **Mathematics 1 and 2** **Systems 1 and 2** Passing of the according examination and the registration of the module have to be proven. Requirement for participation in the module examination: coursework
Computer Systems One of the modules	**6** 3+2	Oral Examination as final module	Compulsory Elective Module

• Adaptive Hardware and Systems • Advanced Computer Architecture • Algorithms for Synthesis and Optimization of Integrated Circuits • Architectures of Parallel Computer Systems • Empiric Performance Evaluation • Hardware/Software Codesign • High–Performance Computing • Intelligence in Embedded Systems • Reconfigurable Computing • VLSI Testing		examination	In case of enrolment under conditions with courses with restrictions **Systems 1 and 2** Passing of the according examination and the registration of the module have to be proven. Requirement for participation in the module examination: coursework
Intelligence and Data	**6**	Oral Examination as final module examination	Compulsory Elective Module In case of enrolment under conditions with courses with restrictions **Algorithms and Models 1 and 2** **Mathematics 1 and 2** **Software Engineering 1 and 2** Passing of the according examination and the registration of the module have to be proven. Requirement for participation in the module examination: coursework
One of the modules • Clustering Algorithms • Intelligence in Embedded Systems • Interactive Data Visualization • Logic and Automated Reasoning • Logic Programming for Artificial Intelligence • Machine Learning I • Machine Learning II • Planning and Heuristic Search	3+2		
Project group	***20***	Module examination of the project work as a phase–related examination	Compulsory module In case of enrolment under conditions with courses with

			restrictions **Soft Skills, Management** Passing of the according examination and the registration of the module have to be proven. Qualified participation in an internship
Seminar I	***5***	Lecture given at a seminar and written assignment, grade equals the module grade	Compulsory module In case of enrolment under conditions with courses with restrictions **Soft Skills, Management** Passing of the according examination and the registration of the module have to be proven.
Seminar II	Identical to Seminar I		
Subsidiary or Extracurricular Studies	**12**		Either a subsidiary or extracurricular studies is studied (except Business Information Technology and Economics)
Subsidiary	12	Module Examination according to the agreements about the subsidiary	On individual application a selectable subsidiary from the catalogue of the standard subsidiaries or the non–standard subsidiary
Extracurricular Studies	12	Examination in the extracurricular studies	
Master's Thesis	30	Examination according to § 17 and § 18	Consisting of work planning, preparation of the master's thesis including the closing presentation

In case of **admission with restrictions** according § 4, section c, courses with restrictions must be completed, if necessary, before a module can be started. The following courses with restrictions are foreseen as requirements for modules:

Course with restrictions	**Scope**	**Requirement for modules of the Focus Area**
Basics in Human–Machine–Interaction	2 SWS	Software Engineering
Mathematics 1 and 2	4 SWS	Algorithm Design Networks and Communication Intelligence and Data
Models and Algorithms 1 and 2	4 SWS	Algorithm Design Intelligence and Data
Soft Skills, Management	2 SWS	Seminar I and II Project group
Software Engineering 1 and 2	4 SWS	Software Engineering Intelligence and Data
System 1 and 2	4 SWS	Networks and Communication Computer Systems

Appendix 2: Agreements about subsidiary for standard subsidiaries in the master's degree course Computer Science

Preliminary remark: more detailed examination modalities conform to regulations of the examination regulations of the respective relevant degree program in the respective current version.

Legend:
MP = Module Examination (*Modulprüfung*)
SP = qualified participation proved by the preparation of a seminar paper
qT= qualified participation (*qualifizierte Teilnahme*)

1. Electrical Engineering

1st – 3rd Semester	2 modules out of • Circuit Engineering • Control Engineering • Communications Engineering • Energy Engineering	MP MP	6 6
		Sum	**12**

2. Mathematics

1st – 3rd Semester	Pursuing modules from the canon of mathematics courses	MP	9
		Sum	**9**

When choosing this subsidiary 3 CP have to be additionally completed in the extracurricular studies.

3. Media Studies

1st – 3rd Semester	Basis module Media theory/– history		
	Introduction Seminar/ Course Seminar/ Course	SP SP SP	4 4 4
		Sum	**12**

4. Philosophy

1st – 3rd Semester	Advanced module 1: Anthropology and Cultural philosophy **Or** Advanced module 2: Practical Philosophy **Or** Advanced module 3: Theoretical Philosophy	In each case: Overall meeting seminar Seminar Module examination	**In each case:** qT qT qT MP	In each case: 12
			Sum	**12**

5. Psychology

1st, 2nd and 3rd semester	Research colloquium cognitive psychology	qT	2
	2 seminars from the course provision from the sub–area of cognitive psychology and work and organisation psychology	qT qT	4 4
	Portfolio examination	MP	2
		Sum	**12**

6. Business Information Technology

1st, 2nd and 3rd semester	All modules from the module catalogue of the faculty for economics with the number M.184.43XX	MP	10
		Sum	**10**

When choosing the subsidiary 2 CP have to be completed in the extracurricular studies.

7. Economics

1st, 2nd and 3rd semester	All modules from the module catalogue of the faculty for economics with the number M.184.43XX	MP	10
		Sum	**10**

When choosing the subsidiary 2 CP have to be completed in the extracurricular studies.

Appendix 3: Course Timetable

<table>
<tr><td colspan="6">Schedule Computer Science Master (exemplary)</td></tr>
<tr><td>1st semester</td><td>Compulsory elective module I (6CP)</td><td>Compulsory elective module II (6 CP)</td><td>Compulsory elective III (6 CP)</td><td>Compulsory elective module IV (6 CP)</td><td>Compulsory elective module V (6 CP)</td></tr>
<tr><td>2nd semester</td><td rowspan="2">Project group (20 CP)</td><td>Compulsory elective module VI (6 CP)</td><td></td><td>Seminar I (5 CP)</td><td>SG/NF</td></tr>
<tr><td>3rd semester</td><td>Compulsory elective module VII (6 CP)</td><td>Compulsory elective module VII (6 CP)</td><td></td><td>SG/NF</td></tr>
<tr><td>4th semester</td><td colspan="5">Master's Thesis (30 CP)</td></tr>
</table>

Appendix 4: Module guide