

General Examination Regulations
for a Bachelor of Science (B.Sc.) Degree in
COMPUTER ENGINEERING
COMPUTER SCIENCE AND COMMUNICATIONS ENGINEERING
AUTOMATION AND CONTROL ENGINEERING
ELECTRICAL AND ELECTRONIC ENGINEERING
METALLURGY AND METAL FORMING
MECHANICAL ENGINEERING
and a Master of Science (M.Sc.) Degree in
COMPUTER ENGINEERING
COMPUTER SCIENCE AND COMMUNICATIONS ENGINEERING
AUTOMATION AND CONTROL ENGINEERING
ELECTRICAL AND ELECTRONIC ENGINEERING
MECHANICAL ENGINEERING
METALLURGY AND METAL FORMING
MANAGEMENT AND TECHNOLOGY OF WATER AND WASTE WATER
COMPUTATIONAL MECHANICS
within the Scope of the Internationally Oriented Academic Programme
INTERNATIONAL STUDIES IN ENGINEERING (ISE)
at the University of Duisburg-Essen
1 October 2008

ATTENTION: Only the rules and regulations in their German form are legally binding.

Pursuant to § 2, paragraph 4, and § 94, paragraph 1, of the Law for Universities of North Rhine-Westphalia (LU) of 14 March 2000 (GV. NRW, p. 190), last modified by the Act of 30 November 2004 (GV. NRW. p. 752), the Faculty of Engineering Sciences at the University of Duisburg-Essen hereby issues the following Examination Regulations:

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I. General Regulations

§ 1

Scope and ISE Disciplines

(1) These Examination Regulations govern the completion of the academic programme ISE at the University of Duisburg-Essen.

(2) The following disciplines can be chosen for the B.Sc. degree in ISE:

- a) Computer Engineering
- b) Computer Science and Communications Engineering
- c) Automation and Control Engineering
- d) Electrical and Electronic Engineering
- e) Mechanical Engineering
- f) Metallurgy and Metal Forming.

(3) The following disciplines can be chosen for the M.Sc. degree in ISE:

- a) Computer Engineering with Majors in
 - Reliable Systems
 - Interactive Systems and Visualization
- b) Computer Science and Communications Engineering
- c) Automation and Control Engineering
- d) Electrical and Electronic Engineering with Majors in
 - Communications Engineering
 - Power and Automation
- e) Mechanical Engineering with Majors in
 - Mechatronics
 - Production and Logistics
 - Energy and Environmental Engineering
 - General Mechanical Engineering
- f) Metallurgy and Metal Forming
- g) Computational Mechanics
- h) Management and Technology of Water and Waste Water.

§ 2

Goal of the Programmes, Purpose of the B.Sc. and M.Sc. Degrees

(1) The purpose of the consecutively designed B.Sc. and M.Sc. degree programmes in ISE is to aid students in the acquisition of the requisite technical knowledge, abilities and methods common to the engineering sciences that will enable them to contribute to scientific research, critically assess work in the field and act in a responsible manner in the context of the growing international integration of the profession. In view of the international orientation of this programme, the training of engineers is being tailored to the globalization of markets and the needs of foreign students.

(2) Students in the B.Sc. degree programme of ISE acquire a wide knowledge of the fundamentals of the engineering sciences, the basic methods and theories relevant to the field, and the skill to apply them.

(3) The B.Sc. is the first degree enabling programme graduates to practice the profession of engineering. The degree certifies that they have acquired the basic knowledge that will enable them to enter the profession or to proceed to the M.Sc. degree, have a command of the underlying technical principles of the discipline and possess the ability to apply its scientific methods and insights.

(4) The pursuit of a M.Sc. degree, the second constituent of the integrated programme within ISE, increases the scientific qualifications acquired in the B.Sc. degree programme by expanding already demonstrated basic knowledge in a candidate's field and by practicing more complex scientific methods.

(5) The M.Sc. degree provides a second professional degree that enables programme graduates to practice the profession of engineering. The M.Sc. degree demonstrates that its recipients have gained the additional expertise, competence, and command of methods needed in integrating technical issues in the field; that they have the ability to work independently in applying scientific methods and insights to problems within their respective disciplines; that its holders have the academic resources to proceed to the doctoral level and hence to an academic career.

§ 3

Bachelor's Degree and Master's Degree

(1) After candidates have completed the requirements for the bachelor's programme, the Faculty of Engineering Sciences at the University of Duisburg-Essen shall award them the degree of 'Bachelor of Science' (B.Sc.).

(2) After candidates have completed the requirements for the master's programme, the Faculty of Engineering Sciences at the University of Duisburg-Essen shall award them the degree of 'Master of Science' (M.Sc.).

§ 4

Admission to the Programme and Special Qualifications for the Engineering Sciences

(1) The qualifications for admission to the bachelor's programme in ISE may be demonstrated by a general or subject-restricted Certificate of Higher Education Entrance Qualification (*Zeugnis der Hochschulreife*) or by statutory regulation or by a certificate recognised by a relevant public agency.

(2) Admission to a bachelor's programme in ISE shall also be granted to those applicants who in accordance with § 49, paragraph 6, of the LU have completed a vocational training programme (*Lehre*). Annex 11 to the Regulations Governing Admission of Vocational Training Graduates of 25 April 2006 of the University of Duisburg-Essen provides further information

(3) Pursuant to § 49, paragraph 5, of the LU, in addition to the formal qualifications there specified, a certified subject-related educational background and aptitude are required for admission to one of the B.Sc. or M.Sc. programmes in ISE as defined in § 4, (4) through (8), and § 5 of these Examination Regulations.

(4) Candidates for admission who have obtained their qualification for higher education from an educational institution inside the Federal Republic of Germany are required to

- a) have achieved the final grade of 3.0 in a basic-programme in mathematics, computer engineering, or any other natural science or engineering science programme in the sixth form (*Gymnasium*, comprehensive school, or vocational school) or, preferably, have completed an intensive programme in one of these disciplines or
- b) demonstrate equivalent knowledge by presenting appropriate documentation.

Applicants who have obtained their qualifications for admission to higher education from an educational institution outside of Germany must prove equivalent qualification by presenting appropriate documentation as covered in (2) above.

(5) Prior to the admission to a programme on the B.Sc. level, students should have completed an internship of at least nine weeks. Although not a part of the academic programme, the internship can nevertheless be completed in tandem to a student's studies. Completion of the internship, for which no ECTS credits will be awarded (see § 7, (3), below), must be documented at the latest at the registration to begin work on the B.Sc. dissertation. The General Internship Regulations for ISE provides additional information on this point.

(6) Pursuant to § 49, paragraph 10, of the LU the prerequisites described in the above paragraphs (1) through (5) can be waived if the applicant provides evidence, by means of an aptitude test or some other determination of ability, of a special talent for a discipline in the engineering sciences meeting the requirements of a general education at the University of Duisburg-Essen.

(7) The prerequisite for the admission to the master's programme in ISE is that the candidate shall have completed either a bachelor's degree in ISE at the University of Duisburg-Essen or an equivalent degree as described in § 13 of these Regulations

(8) The qualifications for admission to a M.Sc. programme in ISE will be demonstrated by

- a) evidence of qualifications relating to the specific degree programmes as defined in §4, paragraph 4, and § 5 and
- b) has completed a B.Sc. degree in ISE with a final of 2.5 or better or

c) has completed a B.Sc. degree or a comparable degree of three years' duration in a natural science or a related engineering science or in computer engineering with a final grade of 2.5 or better at an accredited university as defined by the Framework Act for Universities (*Hochschulrahmengesetz*), provided this degree is recognised as comparable by the Examination Committee or

d) has completed a B.Sc. degree or a comparable degree of three years' duration in a natural science or a related engineering science or in computer engineering with a final grade of 2.5 or better at an accredited university outside the scope of the Framework Act for Universities, provided this degree is recognized by the Examination Committee as comparable to a degree obtained in a) and b) above.

Graduates of other programmes of at least three years' duration can be admitted whenever both a special aptitude for the discipline being studied as defined in § 4, paragraph 4, above can be established and the final grade achieved for the degree corresponds to 2.5 obtained at an institution of higher learning as defined in the LU.

(9) If the admission requirements according to § 4, paragraph 7, are not met or if during the transition from the B.Sc. degree to the M.Sc. degree, a change in the major within ISE has occurred, the Examination Committee can stipulate that the admission to the M.Sc. programme is conditional upon a student's making up specific deficits in her or his course work in the field of engineering sciences by the time that registration to begin work on the M.Sc. dissertation is made. The nature and the extent of these stipulations shall be made by the Examination Committee on an individual basis depending on the scope of the previous programme. The extent of the stipulations can involve a student's adding of up to 30 ECTS credits (see § 7, (3)) to the normal academic programme. § 7, paragraph 1, remains unaffected by this condition.

(10) In adequately argued individual cases the Examination Committee shall allow exceptions to the required minimum grade specified in paragraph (8) above. Affecting this decision are the degree to which the grade falls short of the minimum grade, the grade on the final dissertation of 'good' or better, the length of time spent in completing the degree and an applicant's exceptional individual achievements.

(11) The Examination Committee is responsible for determining a candidate's suitability as defined in § 4, (4) and (6), as well as for establishing of the equity of the final grades received as defined in § 4, paragraph (8). The Examination Committee can require an applicant to submit documentation of previously acquired course-unit and examination credits.

§ 5

Language skills

(1) Applicants who have not acquired their university qualifications at a German speaking institution in the Federal Republic of Germany or at an equivalent institution abroad can be admitted to study a discipline within the academic programme ISE when they demonstrate a knowledge of German by:

- a) demonstrating that German is their native language or
- b) presenting a DSH Certificate (a certificate for the German language test for admission to a German institution of higher learning for foreign students, formerly called 'PNdS) on the level DSH-2 or
- c) presenting a TestDaF Certificate (test of German as a foreign language) with the level TDN 5 in all parts or
- d) presenting a certificate at least equivalent to the TestDaF or
- e) certifying that the language of instruction during their first degree was exclusively German.

(2) Insofar as during registration applicants can demonstrate knowledge of German corresponding at least to the level A2 achieved on the Common European Framework of Reference for Languages (CEFR) test, they can be admitted, in extension of § 5, paragraph (1), with the proviso that they successfully complete a course of instruction in German and achieve the level of C1 on CEFR test.

(3) Prior to admission applicants who are not native speakers of English must demonstrate a knowledge of the language equivalent to the level C1 on a CEFR test by certifying

- a) the passing of an English test with the following results:
 - TOEFL 560 (paper-based)
 - TOEFL 220 (computer-based)
 - TOEFL 83 (internet-based)
 - IELTS: Extremely limited User, Band 7.0
 - University of Cambridge: Certificate in Advanced English
 - or an equivalent test with an equivalent grade or;
- b) that the relevant disciplines were taught exclusively in English at the school or the higher educational institution at which the certification of preparatory training as defined in § 4, paragraph 1, or the first professional qualifying degree was obtained, respectively;

(4) Insofar as during registration applicants who demonstrate a knowledge of English corresponding at least to the level A2 of the Common European Framework of Reference for Languages (CEFR) by means of having

- a. taken English as a major subject during the general qualification for university entrance (*Abitur*) or as a subject at a school of further education for at least four years or
- b. passed one of the following English tests at the level indicated
 - TOEFL 500 (paper-based)
 - TOEFL 173 (computer-based)
 - TOEFL 61 (internet-based)
 - IELTS: Extremely limited User, Band 3
 - University of Cambridge: Key English Test
 - an equivalent grade on an equivalent test

can, in extension of § 5, paragraph (1), be admitted with the proviso that they successfully complete a language course in English at the level C1 on the Common European Framework of Reference for Languages (CEFR) test.

(5) The Examination Committee determines the recognition of the equivalent attainment of the prerequisites defined in § 5, paragraphs (1) through (4).

(6) The compulsory language courses of instruction referred to in § 5, paragraph (2) or (4), where applicable, are part of the degree programme; passing such a language course unit simultaneously satisfies the requirement for a non-technical discipline related to the programme as defined in the annexes of these Regulations.

§ 6

Programme Commencement

(1) Students can begin a bachelor's programme in ISE only in the winter semester.

(2) Students can begin a master's programme in ISE either in the winter or the summer semester.

(3) Matriculation (*Einschreibung*) as a prerequisite for regular admission to a programme is governed by the current version of the Matriculation Regulations of the University of Duisburg-Essen.

§ 7

Standard Duration of the Programme, Curriculum Structure, Programme Scope, ECTS Credits

(1) The standard duration for completing the B.Sc. programme, including the time spent passing the continuous assessment examinations and completing a six-week industrial internship and the dissertation, is three academic years or six semesters.

(2) The standard duration for completing the M.Sc. programme, including the time spent passing continuous assessment examinations and completing the dissertation, is two academic years or four semesters.

(3) All course units (*Lehrveranstaltungen*) of the programmes are modular. A module comprises a block of thematically organised and sequentially coordinated instructional units (seminars, lectures, exercises, laboratories and the like) to which a pre-determined number of European Credit Transfer System (ECTS) credits corresponding to the amount of time required for completion of the units in the modules are assigned. An ECTS number, based upon a conversion formula explained in Annex 1, represents the hours per semester a student can be expected to expend in completing an instructional unit within a module. The goals and contents of the instructional units are recorded in writing by the Faculty in the *Module Handbook* that can be modified if and when the need arises at the suggestion of the appropriate Examination Committee. The ECTS credits themselves do not imply a qualitative evaluation of a student's performance. All graded modules entail continuous assessment examinations, and the grades received on them are averaged into a student's final grade.

(4) In the guides to the disciplines in ISE (see the Annexes) the constituents of the programme are structured in such a way that all degree programmes can be completed within the standard duration. At the same time this stipulation ensures that students can tailor their programmes to match their own preferences and interests and that compulsory and elective course units maintain a balanced proportion in their studies.

(5) The first-year course units for all students in the B.Sc. programme in ISE are for the most part identical. Depending on the number of students in each unit, a change in the disciplines mentioned in § 1, paragraph 2, is possible up to the end of the first year during the re-enrolment deadline.

§ 8

Internship

(1) During the bachelor programme and irrespective of § 4, paragraph (5), an internship of six weeks must be completed. The internship is a part of the programme, and its completion must be demonstrated at the latest during the registration for the commencement of the work on the bachelor's dissertation.

(2) The nature and contents of the internship is governed by the General Internship Regulations for ISE. In cooperation with the Internship Office of the Faculty of Engineering Sciences, the Examination Committee ensures the compliance with the Internship Regulations.

(3) Students majoring in Mechanical Engineering are urgently recommended to have completed an internship related to their field of at least twenty weeks by the end of their M.Sc. programme, but whenever possible during the course of their B.Sc. degree programme. The additional five weeks (in comparison to the fifteen required of other M.Sc. disciplines; see § 4, (5)) are not part of the M.Sc. programme, but they represent a prerequisite for changing institutions of higher learning within Germany.

§ 9

Experience Abroad

(1) Students who acquired their qualifications for admission to higher education at an educational institution where German was the language of instruction must be able to document at least one period abroad during their studies in ISE. For students beginning their studies in a B.Sc. programme in ISE, time spent abroad is compulsory. For students who have acquired a B.Sc. degree in ISE and are continuing on to the integrated M.Sc. programme, a stay abroad is optional.

(2) Students are obliged to spend between three and six months abroad.

(3) With reference to (1) period can be used for

- a) taking course units at a university and thereby acquiring at least 15 ECTS credits or
- b) completing the B.Sc. or M.Sc. dissertation or
- c) completing an industrial internship.

(4) The experience abroad should be normally spent in a facility in which English is the *lingua franca*. If the period is being used to acquire course unit credits or work on a B.Sc. or M.Sc. dissertation, a general cooperative agreement on the recognition of credits should be concluded between the Faculty of Engineering Sciences of the University of Duisburg-Essen and each host institution and recorded with the Examination Committee before the beginning of the sojourn. If such is not the case, then credits as well as the period abroad will be recognised only if the student concerned receives written confirmation in advance of the acceptability of both.

§ 10

Organisation of the Examinations, Registration and Deregistration

(1) The examinations in each B.Sc. subject in ISE consist of continuous assessment examinations and course-related examinations as described in § 32 and the B.Sc. dissertation concluding the programme as described in § 33.

(2) The examinations in each subject in the M.Sc. programme of ISE consist of continuous assessment examinations and course-related examinations as described in § 40 and the M.Sc. dissertation concluding the programme as described in § 41.

(3) Continuous assessment examinations demonstrate an immediate confirmation of the successful completion of a course unit or module and of the acquisition of the knowledge and skills taught therein. These examinations demonstrate a student's understanding of the course unit or module material and its interrelationships to other basic concepts in the field of engineering sciences.

(4) Continuing assessment tests are given at the latest in the semester break following the semester in which the course units they assess are taught. The test dates shall be announced in due time.

(5) For every test required in the programme students are required to register during the period of registration and in the form determined by the Examination Committee. It may grant exceptions. The cancellation of the registration for an examination can be done in a manner also determined by the Examination Committee within the period of deregistration, which ends two weeks prior to the date of the examination

(6) Continuous assessment tests are normally held in the lingua franca of the course unit. Exceptions must be granted by the Examination Committee.

(7) If a supplementary viva accompanies a written examination (in compliance with § 21) the date of the viva shall be arranged by the examiner and the students, and the Examination Committee notified. The period of time between the announcement of the grades for a written examination and the date for a viva shall normally be at least seven days, but shall not exceed four weeks.

(8) If a student submits valid medical documentation that convincingly demonstrates his or her lengthy or chronic incapacity to sit an examination in the prescribed manner or in the prescribed scope, the Chairperson of the Examination Committee may grant this student, upon her or his application, the opportunity to present comparable work in another form.

§ 11

B.Sc. and M.Sc. Credit Requirements

(1) A B.Sc. programme in ISE has been completed when the following 180 ECTS credits (see § 7, (3)) have been acquired:

- 159 ECTS credits from the tested modules comprising the compulsory and elective course units as defined in § 31, consisting of
 - 60 ECTS credits in the technical compulsory and mostly identical first-year B.Sc. course units
 - 83 ECTS credits in the remaining technical compulsory second- and third-year course units
 - 3 ECTS credits in the technical elective module
 - 6 ECTS credits for a practical project
 - 7 ECTS credits in the non-technical module.
- 6 ECTS credits for the internship according to § 8, paragraph 2,
- 12 ECTS credits for the B.Sc. dissertation according to § 32 and
- 3 ECTS credits for the B.Sc. dissertation colloquium.

(2) An M.Sc. programme in ISE has been completed when the following 120 ECTS credits have been acquired:

- 90 ECTS credits for the tested modules comprising the compulsory and elective course units as discussed in § 39, consisting of
 - a) in the M.Sc. disciplines 'Computer Engineering', 'Electrical and Electronic Engineering', 'Mechanical Engineering', 'Computer Science and Communications Engineering', 'Automation and Control Engineering' and 'Metallurgy and Metal Forming'
 - 70 ECTS credits in the technical compulsory modules
 - 12 ECTS credits in the technical elective modules
 - 8 ECTS credits in the non-technical module.
 - b) in the M.Sc. discipline 'Computer Engineering'
 - 73 ECTS credits in the technical compulsory modules
 - 12 ECTS credits in the technical elective module
 - 5 ECTS credits in the non-technical module.
 - c) in the M.Sc. discipline 'Management and Technology of Water and Waste Water'
 - 66 ECTS credits in the technical compulsory modules
 - 12 ECTS credits in the technical elective modules
 - 4 ECTS credits for an internship
 - 8 ECTS credits in the non-technical module.
 - d) in the M.Sc. discipline 'Computational Mechanics':
 - 52 ECTS credits in the technical compulsory modules
 - 30 ECTS credits in the technical elective module
 - 8 ECTS credits in the non-technical elective module
- 27 ECTS credits for the M.Sc. dissertation according to § 40 and
- 3 ECTS credits for the M.Sc. dissertation colloquium.

(3) For all students in a B.Sc. or M.Sc. programme in ISE an ECTS Credit Account that documents their continuous progress shall be opened and maintained by the Examination Committee. As modules are successfully completed, the number of ECTS credits earned shall be entered into the students' accounts. The account includes the grade points, credit points and the GPAs (see § 22) of completed modules. At any point in their studies, students shall have access to their accounts.

(4) Students must earn 60 credits per year. Students who acquire fewer than 40 credits within the first academic year in a B.Sc. or M.Sc. programme shall be required to meet with their programme advisor(s). The Examination Committee is responsible for specific cases.

§ 12

Examination Committee

(1) The Faculty of Engineering Sciences shall establish an Examination Committee that oversees the organisation of examinations and examination activities for the academic programmes in ISE.

(2) The Examination Committee consists of the Chairperson, his or her Vice-Chairperson and seven additional members. The Chairperson, his or her Vice-Chairperson and three additional members shall be chosen from the group of professors, two members from the group of the academic staff and two members from the group of students, all of whom will be elected by the Faculty Council from the nominations supplied by the executive organs of the respective groups. With the exception of the Chairperson and his or her Vice-Chairperson, alternates for all members of the Examination Committee will be elected. The term of office for the professors and the academic staff members is three years, whereas for the student members the term is one year only. Re-election is possible. The election of the members and their alternates is designed to ensure parity for all the engineering sciences in ISE.

(3) The Examination Committee is an administrative body as defined by Administrative Law and Administrative Procedure Law.

(4) The Examination Committee assures that the provisions of the Examination Regulations are adhered to and is responsible for the proper supervision of examinations. The Examination Committee decides on a student's eligibility to sit examinations and on the recognition of course unit credits and examination credits as defined in § 13. It is especially responsible for adjudicating matters in which appeals are lodged against decisions made in the course of examinations. In addition, the Committee is obligated to report to the Faculty Council regularly, but at least once a year, on the development of examinations and the duration of study. The Committee shall suggest reforms in the Examination Regulations and the programmes and publish the breakdown of examination results. In all normal cases it can delegate these duties to the Chairperson or the Vice-Chairperson; however, such authority does not apply to the establishment of joint procedural rules, decisions taken on appeals and the annual report to the Faculty Council.

(5) The Chairperson convenes the Examination Committee. She or he must do so when it is demanded by one member of the Examination Committee or by the Dean of the Faculty of Engineering Sciences.

(6) The Examination Committee is quorate when, besides the Chairperson or his or her Vice-Chairperson, two members from the group of professors and two additional eligible voting members are present. Resolutions are passed with a simple majority vote. In the case of a tie vote, the decision is left to the Chairperson. The student members of the Examination Committee have no role in the evaluation and recognition of course unit credits or examination credits.

(7) The members of the Examination Committee have the right to be present at examinations.

(8) The meetings of the Examination Committee are not public. Its members and their alternates are bound by an oath of confidentiality. If because of a contractual obligation accruing to the status of civil servants or the like, they are not already bound by such an oath, the Chairperson of the Examination Committee is obligated by the law governing the formal obligation pertaining to non-civil servants (Law of Obligation) to require them to comply with this obligation.

(9) The Examination Committee rules on the recognition of internship activities as well as on appeals lodged against such decisions. It is also possible to delegate recognition of internship activities to a Internship Office.

(10) For assistance in performing the duties of the Examination Committee in accordance with § 4 and § 5, the Dean can establish an Assessment Committee and appoint its members.

(11) The Assessment Committee in accordance with § 12, paragraph (10) above, consists of the Chairperson, his or her Vice-Chairperson, two members from the group of professors and two members from the group of the academic staff. Alternates are designated for the members of the Committee, with the exception of the Chairperson and his or her Vice-Chairperson; paragraph (2), sentences 4-6, apply correspondingly. At least one of the members of the Assessment Committee must be a member of the group of professors from the Examination Committee as described in paragraph (2), sentence 2 above. The Chairperson shall be a member of the group of professors in the Examination Committee pursuant to paragraph (2), sentence 2.

(12) The Assessment Committee is quorate when besides the Chairperson or his or her Vice-Chairperson, two members from the group of professors as well as one additional eligible voting member are present. With respect to other substantive matters, paragraphs (5) and (6), sentences 2-4, and paragraph (8) in this section are in force.

(13) The Examination Committee shall cooperate with the relevant Examination Office in the organisation and implementation of examinations in the B.Sc. and M.Sc. programmes.

§ 13

Recognition of Previous Academic Work (Course Unit Credits and Examination Credits); Advance Placement

(1) Duration of a programme, credits for course units and examinations from the same or a comparable degree programme in the fields of the engineering sciences, computer engineering or natural sciences at the University of Duisburg-Essen or other universities in the Federal Republic of Germany or in equivalent disciplines in domestic or foreign institutions of higher learning with ECTS rating systems will be recognized without equivalency verification.

(2) Duration of study, course unit credits and examination credits in other academic programmes at the University of Duisburg-Essen or at other universities within the Federal Republic of Germany shall be recognised if equivalency is established. Duration of study, course unit credits and examination credits acquired at a foreign institution of higher learning that do not correspond to (1) shall be recognised upon application if equivalency is established. Equivalency is established if duration of study, course unit credits and examination credits fundamentally correspond in content, scope and academic standards to those in the corresponding curriculum of the B.Sc. or the M.Sc. programmes in ISE. Here a point-for-point comparison should not be undertaken but rather an appraisal and evaluation of the whole programme. In the procedure of establishing equivalency of duration of study, course unit credits and examination credits at foreign institutions of higher learning, the equivalency agreements achieved by the Standing Conference of the Ministers of Education and Cultural Affairs and the German Rectors' Conference are to be observed. Equivalency of duration of study, course unit credits and examination credits at foreign institutions of higher learning that do not correspond to paragraph (1) above can normally be established when they have been acquired in the framework of an exchange programme in which the Faculty of Engineering Sciences participates. This is valid for all mobility programmes for which agreements on the part of the Faculty and for Faculty and University partnerships and centrally coordinated mobility programmes exist. In addition, in cases where doubt as to equivalency occurs, the Central Office for Foreign Education can be consulted.

(3) Pursuant to the recognition of duration of a programme, course unit credits and examination credits acquired in officially recognised integrated institutions of campus and distance learning or in similar institutions established in North Rhine-Westphalia in cooperation with other federal states or the federal government, paragraphs (1) and (2) above, where applicable, are in force. In addition, paragraph (2) applies also for the duration of study, course unit credits and examination credits acquired at other educational institutions, especially at state or officially recognised institutions of cooperative education as well as technical colleges, schools of engineering and military academies in the former German Democratic Republic.

(4) Upon application by a student other credits and qualifications based upon documentation presented by the student can be recognised.

(5) On the basis of an aptitude test as described in § 49, paragraph 11, of the LU, applicants who are entitled to begin their studies in an advanced subject-semester shall be granted as course unit credits and examination credits the knowledge and skills established by the test for their chosen B.Sc. discipline in ISE. The confirmation in official documentation of the results of the aptitude test is binding on the Examination Committee.

(6) Responsibility for recognizing credits as defined in paragraphs (1) through (5) above rests with the Examination Committee. The Examination Committee shall issue regulations for the recognition of credits from existing disciplines at the University of Duisburg-Essen. Should doubts as to equivalency arise, specialists in the fields must be consulted.

(7) When course unit credits and examination credits are recognised, the grades, insofar as the grading systems are comparable, are to be accepted and, consequently, the corresponding ETCS credits awarded. These grades are to be averaged into the course unit grade, the module grade, and the final grade. However, when the grading systems are not comparable, the notation 'passed' shall be used. This evaluation shall not be used in calculating the respective module grade nor shall it be averaged into the final grade. The recognition shall be entered into the Certificate as a footnote.

(8) Insofar as the prerequisites in paragraphs (1) through (5) above are fulfilled, a legal right to have these credits recognised exists. The recognition of duration of study, course unit credits and examination credits acquired in the Federal Republic of Germany must be decided by the appropriate official bodies. Students are required to present to the Examination Committee the documents relevant for the recognition.

§ 14

Examiners and Assessors

(1) Eligibility as an examiner or assessor is restricted to professors, visiting professors, academic staff who have completed their *Habilitation* as well as academic staff who possess at least an M.Sc. degree or an equivalent degree and have taught course units in the subject being tested. The first examiner or assessor must be a member of a university.

(2) The Examination Committee appoints the examiners and assessors. It can delegate the appointing to the Chairperson. Normally, examiners will be members of the teaching staff in conformity with paragraph (1), sentence 1 above, who have taught in the area comprising the examination subjects.

Exemptions must be approved by the Examination Committee if a qualified examiner as defined in sentence 3 is not available. In the case of compulsory core course units taught by visiting professors or other visiting teaching staff, the member of staff who regularly offers these course units shall be appointed examiner for resit examinations.

(3) Examiners work independently in their function as examiners. They are responsible for the drafting and the conducting of the examinations. They determine and announce the aids that students may use in taking examinations.

In organisational matters (the scheduling of dates, places and invigilation of the examinations) the examiners work closely with the Examination Committee and the Examination Office.

(4) Students may propose the first examiner or advisor for their B.Sc. or M.Sc. dissertations. These proposals when possible should be taken into consideration. The proposals do not, however, constitute a legal right.

§ 15

Continuous Assessment Examinations

(1) The continuous assessment examination requirements can be satisfied

1. in written form in accordance with § 16 or
2. in oral form in accordance with § 17 or
3. as a lecture or
4. as an oral report or
5. as a combination of the forms in 1. through 4.

At the beginning of every course unit students are to be informed of the form and the duration of the examination that will conclude the course unit. The form and the duration will be determined by the examiner and apply to all candidates uniformly; § 10, paragraph 9 above, remains unaffected.

§ 16

Written Examinations

(1) On the written examinations in the B.Sc. disciplines in ISE, candidates must demonstrate, within the specified time limitations, that on the basis of the requisite knowledge and with the help of auxiliary aids, they can identify a given problem from their field and, using the applicable methods pertaining to that discipline, reach a solution.

On the written examinations in the M.Sc. disciplines in ISE candidates must demonstrate, within the specified time limitations, that on the basis of a broad knowledge and with the help of auxiliary aids, they can identify a problem from the area being examined and with a sophisticated understanding of the applicable methods of their field apply independent ideas and means to finding a solution.

Written examinations are to have a duration of between one and two hours. Exceptions have to be approved by the Examination Committee.

(2) Every written examination will be evaluated according to the grading scale in § 19. The grades are the result of the arithmetic average of the individual evaluations in accordance with § 19 paragraph 2. The criteria for the grading should be made clear. Students should have the opportunity to examine their examinations after they have been graded. The Examination Committee shall decide on additional matters.

(3) The last resit examination should be graded by two examiners according the grading scale in § 19. Only in extreme circumstances and with the permission of the Examination Committee can this regulation be deviated from; the circumstances are to be officially documented.

(4) The grading process shall normally not exceed four weeks. Deviations from this regulation are permitted only in extreme circumstances, and the reasons are to be officially documented. The grade assigned to a written examination is to be communicated in writing to the Examination Committee immediately after the grades are determined

§ 17

Oral Examinations (Vivas)

(1) During a viva, students should demonstrate their ability to recognise interrelationships in the area being examined and to be capable of dealing with particular problems arising in these contexts. Moreover, the viva should additionally establish that candidates have mastered the proposed educational goals in their courses units.

(2) Vivas normally involve the testing of an individual or a group by one examiner in the presence of an assessor. Prior to the assigning of the grade as defined in § 19, paragraph 1, the assessor must be consulted.

(3) Vivas should last between 30 and 60 minutes. The time devoted to the examination should be commensurate with the number of ECTS credits to be awarded for the course unit being tested.

(4) The main points covered in a viva and the results are to be recorded in minutes to the viva. At the conclusion of the viva, a student is to be informed of the grade awarded. The grade for any viva must be communicated in writing to the Examination Committee immediately after, but within one week at the latest following, the date of the examination.

(5) Students who wish to take the equivalent viva at a later date are allowed, space permitting, to observe the proceedings prior to their own viva, unless the student being examined objects. However, this permission does not extend to the discussion or announcement of the examination results.

§ 18

Homework, Minutes, Lectures, Reports

(1) The regulations governing homework, minutes, lectures and reports as well as other types of examinations are determined by the Examination Committee. For homework and minutes the regulations for the written examination apply correspondingly with the exception that the grading by one examiner is sufficient. Lectures or oral reports are to be given following more precise regulations laid down by the examiner and will be graded only by this person.

§ 19

Examination Assessments (Grades)

(1) Grades for the individual course unit assessments are assigned by the appropriate examiners. For this assessment the following grades are to be used:

- 1 = very good = a superior performance
 2 = good = a better than average performance
 3 = satisfactory = an average performance
 4 = sufficient = a flawed but still acceptable performance
 5 = insufficient = a seriously flawed, unacceptable performance

Lowering or raising individual grades by 0.3 results in a more precise grade in the range between 1.0 and 4.0.

(2) If a continuous assessment examination is evaluated by more than one examiner, then the grades shall be calculated from the arithmetic average of the individual grades. The grades shall be calculated to the first decimal place; all additional decimal places shall be disregarded. The grading scale is as follows:

- very good = an average of and including 1.5
 good = an average of 1.6 to and including 2.5
 satisfactory = an average of 2.6 to and including 3.5
 sufficient = an average of 3.6 to and including 4.0
 insufficient = an average of 4.1 and lower.

(3) A continuous assessment examination has been passed when it has been awarded the grade of 'sufficient 4.0' or better. A continuous assessment examination has definitively been failed if it has been given a grade of 'insufficient 5.0' and all the possibilities to repeat it as defined in § 20 have been exhausted.

(4) Laboratory experiments and non-technical subjects are evaluated with either a 'pass' or 'fail'.

§ 20

Resit Examinations

(1) Continuous assessment examinations that have once been passed may not be repeated. The Examination Committee can make exceptions. Students will be notified about tests that have definitively been failed and provided with information on legal remedies available.

(2) Continuous assessment examinations that have not been passed or are regarded as not having been passed can be repeated twice.

(3) For the resit opportunity of a continuous assessment examination, the student must sit the next available scheduled examination. The Examination Committee must guarantee that each continuous assessment examination must be made available at least twice within the next two following semesters. If there are no justifiable grounds for a student's failure to observe the time limitations, she or he shall lose the right to resit the examination.

(4) If the student achieves a grade of lower than 4.0 on the first resit opportunity for a written continuous assessment examination, then the student must be allowed to take a supplementary viva for the same course unit for which the written examination received a failing grade in the same examination period (as defined in § 21) before a failing grade is given

§ 21

Supplementary Vivas

(1) A supplementary viva in the event of failures on a written continuous assessment examination (as mentioned in § 20, paragraph 4) enables students to demonstrate orally that they have, in fact, mastered the essentials taught in the course unit whose written examination they failed.

(2) The supplementary viva must be taken in the same continuous assessment examination period in which the written examination occurred. At the same time as the results of the written test are made known, prompt scheduling for the registration and conducting of the supplementary viva will be published.

(3) Based on the result of a supplementary viva, the continuous assessment examination is graded either as 'sufficient' (4.0) or 'insufficient' (5.0). The student is to be told the result of the viva immediately after the examination

(4) The regulations governing the supplementary vivas are specified in § 17, paragraphs 2 through 4 above.

§ 22

Module Grades

(1) A module has been completed when all the continuous assessment examinations for course units comprising the module have been passed. When a module has been successfully completed, the requisite ECTS credits will be entered into the student's Credit Account.

(2) The grades for modules requiring grades are calculated from the arithmetic mean of the continuous assessment examinations for course units making up the module. For this purpose the ECTS credits assigned to a successfully concluded course unit is multiplied by the grade points (1.0 through 4.0) achieved in passing the continuous assessment test, yielding a certain number of credit points. The sum of all the credit points achieved within a module divided by the sum of all the ECTS credits in the module results in the grade point average (GPA) of a module. In this calculation only the first decimal place is relevant; all other decimal places are to be disregarded. (On the terms *grade points*, *credit points*, and *grade point average*, see Annex 1)

§ 23

Changes in Examination Subjects

(1) In each examination subject, students can, as long as the condition in sentence 3. below is observed, change a subject requiring a continuous assessment examination on the condition that the number of attempts to pass continuous assessment examinations in the previous subject carries over to the new subject. The prerequisites for changing the subject are that

1. the previous subject has been taken at the University of Duisburg-Essen
2. the new subject belongs to the same module as the previous subject
3. the previous examination in the subject has not been definitively failed.

This kind of substitution may be used to

- a) change a subject in a compulsory, technical module that, with respect to the corresponding examination, offers a chance to choose between various course units
- b) change a subject within a technical elective module
- c) change a subject within a non-technical elective module.

§ 24

Final Grades for the B.S. and M.Sc. Degrees

(1) The final grade for the B.Sc. degree and the M.Sc. degree is calculated and expressed as a grade point average (GPA).

(2) The final grade point average for the B.Sc. degree is calculated according to the same principle as that used in arriving at the module grades (see § 22). For all the successfully completed continuous assessment examinations in addition to the B.Sc. dissertation as described in § 33, the credit points are calculated as described in § 22. The sum of all the credit points attained in the compulsory and elective subjects and awarded the B.Sc. dissertation divided by the sum of the ECTS credits attained in the compulsory and elective subjects and assigned to the B.Sc. dissertation result in the grade point average for the B.Sc. degree. Ungraded credits, such as internships, non-technical course units and other credits not receiving grades are not figured into the GPA. In this calculation only the first decimal place is relevant; all other decimal places are to be disregarded. Moreover, § 22 applies where relevant. Annex 3 to these Examination Regulations provides a sample calculation of a final grade point average.

(3) The final grade point average for the M.Sc. degree is calculated according to the same principle as that used in arriving at the module grades (see § 22). For all the successfully completed continuous assessment examinations in addition to the M.Sc. dissertation as described in § 41, the credit points are calculated as described in § 22. The sum of all the credit points attained in the compulsory and elective subjects and awarded the M.Sc. dissertation divided by the sum of the ECTS credits attained in the compulsory and elective subjects and assigned to the M.Sc. dissertation result in the grade point average for the M.Sc. degree. In this calculation only the first decimal place is relevant; all other decimal places are to be disregarded. Moreover, § 22 applies where relevant. Annex 3 to these Examination Regulations provides a sample calculation of a final grade point average.

(4) In addition to the assignment of a GPA for the B.Sc. and the M.Sc. degrees, ECTS grades are also provided, as described in paragraph (2) or (3) above, respectively. The ECTS grades are determined by the final grades of the last 100 graduates. The ECTS grades are

- A for the best 10% of the graduates
- B for the next best 25% not included in A
- C for the next best 30% not included in A or B
- D for the next best 25% not included in A, B or C
- E for the remaining graduates.

(5) If the GPA for either the B.Sc. or the M.Sc. degree is 1.3 or better, the notation 'Passed with Distinction' ('cum laude') will be entered on the Certificate or Diploma Supplement, as described in § 36 or § 44.

§ 25

Additional Subjects

(1) Students can take examinations in additional subjects beyond those in the compulsory and elective-compulsory course unit groups.

(2) The results of an examination in such an additional subject shall not be averaged into the module grades nor into the final grade. The results shall be recorded in the Supplement to the Diploma.

§ 26

Absence, Withdrawal, Deception, Statutory Violations

(1) A test or examination is deemed 'insufficient' (5.0) if a student fails, without previous notification, to appear at a test for which her or his name has been entered or if she or he withdraws with insufficient justification from an examination after it has begun. The same applies to examinations that are not submitted within the designated time.

(2) Should a student be prevented by illness from sitting an examination and has documented this incapacity by means of a medical certificate, then her or his absence at the examination shall not be deemed a failure. In such a case she or he shall take the examination at the next available opportunity. This certificate must be presented to the Examination Committee without delay, at least within three working days following the date of the examination. Pursuant to the reasons for the non-participation on examinations or for the non-compliance with other examination deadlines according to (1), a student's illness or that of a child for whose care she or he bears the chief responsibility is deemed equally applicable.

In the cases of recurrence or doubt a student can be granted special requirements.

(3) Should a student attempt to influence her or his results by deception, including plagiarism, or the use of impermissible auxiliary aids, then the resulting work shall receive the grade of 'insufficient' (5.0). This determination shall be made by the respective examiner or assessor and officially recorded. A student who disturbs the ordinary course of an examination can be excluded from further participation in the examination by the responsible examiner or invigilator; in such a case the resulting work shall receive the grade of 'insufficient' (5.0). In serious cases the Examination Committee can forbid the student to sit additional examinations.

(4) The student so implicated can demand, within fourteen days following the examination date, that the decisions taken according to paragraph (3) be reviewed by the Examination Committee. The decisions made by the Examination Committee affecting the student, the reasons for making them and an explanation of legal remedies must be communicated in writing to the student.

(5) The Examination Committee can require and administer a student's declaration in lieu of an oath that her or his performance on the examination has been accomplished independently and without the use of inadmissible external help. Whoever wilfully a) incorrectly makes a declaration in lieu of an oath in the sense specified in sentence 1 or b) commits or undertakes a deception in the sense specified in paragraph (4) acts improperly. The responsible administrative authority for the prosecution and punishment of minor offences in accordance with sentence 2, letter a) and b) is the University Chancellor. In the event of several or otherwise serious attempts to deceive, the examinee can be expelled from the University.

§ 27

Students in Special Circumstances

(1) For disabled students with special examination needs the Examination Committee, upon receipt of a student's application, shall make special and fair examination arrangements that take into consideration the student's individual disablements.

(2) For students to whom the protection clauses corresponding to §§ 3, 4, 6 and 8 of the Maternity Protection Act apply or for whom the periods of time of the Federal Law on Child Raising Allowance and Leave are in effect, the Examination Committee, upon receipt of an application, will arrange special examination concessions to the rules stipulated in these Examination Regulations that conform to the individual needs of such students.

(3) For students who nurse or take care of spouses, registered life partners, direct descendants, in-laws of the first degree, when this person is in need of nursing or intensive care, the Examination Committee, upon application of a student so affected, will modify the deadlines stipulated in the Examination Regulations that have been adversely affected by this responsibility for care to accommodate the student.

§ 28

Invalid B.Sc. and M.Sc. Degrees; Nullification of the B.Sc. and M.Sc. Degrees

(1) Should a student have been guilty of practicing deception on a continuous assessment examination and should this information become known only after the issuance of the B.Sc. or M.Sc. Certificate, the Examination Committee can retroactively amend the grades for the examination results achieved by means of deception and declare the examination totally or partially failed.

(2) If the conditions for the eligibility for an examination have not been fulfilled and—assuming that the student is innocent of deception—should this circumstance become known only after the issuance of the B.Sc. or M.Sc. Certificate, this deficit can be remedied by the student's passing the examination. If the eligibility was intentionally and unjustly obtained, the Examination Committee shall decide upon the legal consequences pursuant to the Administrative Procedure Act for the federal state of North Rhine-Westphalia.

(3) Before any decision is made the student in question must be heard.

(4) All incorrect continuous assessment examination documents are to be collected and if necessary reissued. A decision pursuant to paragraphs (1) and (2), sentence 2, is not possible once five years following the issuance of the examination documents have elapsed.

(5) If the examination in its entirety has been declared as not passed, then the granted degree is to be invalidated and the issued Diploma confiscated.

§ 29

Access to Examination Records

(1) After completion of individual continuous assessment examinations, students shall upon application be granted access to their written examination results.

(2) The continuous assessment examination records consist of

a) a card that contains at least the following entries:

- surname, first name, matriculation number, place and date of birth
- bachelor programme and major
- commencement of studies (date)
- examination papers
- examination qualifications
- dates of registration
- Diploma Supplement
- title of bachelor's dissertation
- date of completion of degree
- date of the Certificate and the Diploma

b) copy of the Certificate and Bachelor's Diploma

c) written examinations/minutes of vivas

The examination records can be maintained electronically.

II. Bachelor of Science Examination Procedure

§ 30

Constituents of the Procedure

The B.Sc. examination procedure is composed of

1. the continuous assessment examinations as defined in § 32 and the corresponding regulations in the annexes of these Regulations
2. the B.Sc. dissertation as described in § 33.

§ 31

Registration for the First Continuous Assessment Examination in the Bachelor's Programme

(1) Only those students may register for the first continuous assessment examination in a bachelor's subject in ISE who have previously registered at the University of Duisburg-Essen for the corresponding bachelor's discipline in ISE and who, in addition, at the time of the first registration for an examination, irrespective of the regulation in § 64, paragraph 2, No. 5, of the LU in the context of § 48, paragraph 5, sentences 2 through 4, have not been deregistered or who, in accordance with § 52 of the LU, have been admitted as a visiting students.

(2) The Examination Committee shall establish deadlines for the registration for the first bachelor's continuous assessment examination. The application should include the following documentation:

1. verification of the prerequisites as mentioned in (1) above and
 2. a statement as to whether the student has already definitively failed to qualify for a B.Sc. degree in the identical or a similar degree programme or for a degree (*Diplomprüfung*) in a similar discipline and whether the student is currently enrolled in one of these degree programmes.
- (3) The authorisation to sit the examination is to be denied if
- a) the requirements mentioned in (1) are not fulfilled or
 - b) the documentation is incomplete or
 - c) the student has already definitively failed to qualify for one of the degrees mentioned in paragraph (2), no. 2, or
 - d) the student is currently enrolled in one of the degree programmes mentioned in paragraph (2), no. 2.

§ 32

Continuous Assessment Examinations in Compulsory and Elective Subjects

The examinations in the compulsory and elective subjects of the respective subjects chosen will be conducted in accordance with § 10 and § 15 and with the existing conditions governing the chosen subject as enumerated in the annexes to these Examination Regulations.

§ 33

B.Sc. Dissertation

(1) The B.Sc. dissertation is the part of the examination procedure that concludes the academic education in every B.Sc. discipline in ISE. It is designed to demonstrate that within a given period of time a student is capable of identifying and, with the use of scientific methodology, independently handling a problem within a recognised field of the engineering sciences.

(2) Permission to begin work on the B.Sc. dissertation is granted only to those candidates who have

1. accumulated at least 120 ECTS credits
2. satisfied the internship requirements described in § 8, paragraph 1, and therefore accumulated 6 ECTS credits and
3. produced evidence of the necessary provisos, where necessary, as defined by § 4 and § 5.

(3) The topic of a B.Sc. dissertation must be thematically related to the corresponding discipline in ISE that candidates have chosen as their major. The dissertation is normally proposed and supervised by a professor, a member of the academic staff, or a member of the academic staff authorised to examine students independently (*Privatdozent*) from the Faculty of Engineering, or a visiting professor currently employed in the Faculty of Engineering or a visiting member of the academic staff who teaches course units in ISE. The student has the right to suggest a dissertation topic. If the B.Sc. dissertation is to be done at an institution outside of the University, the Examination Committee must approve this undertaking. In response to an application by a student, the Chairperson of the Examination Committee is responsible for ensuring that she or he be provided in reasonable time with a topic for the B.Sc. dissertation. The date of the issue of the topic for the B.Sc. dissertation is to be officially recorded by the Chairman of the Examination Committee issuing the topic.

(4) The time normally devoted to the B.Sc. dissertation is three months. In exceptional cases and in response to a written application to the Chairperson of the Examination Committee by the student at least two weeks before the expiration of the deadline, this period can be extended by up to three weeks. The topic and the purpose statement of the dissertation have to be of such a nature that the deadline for the project can be met. The topic can be changed only once and only within the first month following the date of issue of the topic.

(5) The B.Sc. dissertation can in adequately substantiated cases be completed as a group project when the performance under examination for each student is so clearly demarcated by means of the identification of sections or pages or other objective criteria that the evaluation of the individual contributions can be made and the requirements in (1) fulfilled.

(6) The B.Sc. dissertation, normally of 30 to 40 pages, must be drafted in German or English and submitted to the Examination Committee in triplicate, printed and bound in DIN A4 format, on or before the deadline. Significant detailed results can, where applicable, be summarised in an annex. When submitting the B.Sc. dissertation, students must guarantee in writing that they alone wrote the dissertation or, in the case of a joint project, their own part of the dissertation, and used no other sources or auxiliary aids than those acknowledged and no quotations other than those cited. The date of submission should be registered officially. Should the B.Sc. dissertation not be submitted on time, it shall be graded as 'Insufficient' (5.0).

(7) The B.Sc. dissertation is normally to be graded, and the grade justified, by two examiners; the first examiner should be the member of staff who proposed the topic of the dissertation. Exceptions to this rule must be approved by the Examination Committee, which appoints the second examiner. At least one of the examiners has to be a member of the Faculty of Engineering Sciences at the University of Duisburg-Essen. The individual grading is to be carried out in conformity with the grading scale in § 19, paragraph 1. The grade on the B.Sc. dissertation is an arithmetic average of the two examiners' grades, as long as the difference is not more than 2.0. When, however, the difference is greater than 2.0, the Examination Committee shall appoint a third examiner to grade the dissertation. In this case the grade shall be computed by averaging the two best grades. However, the dissertation can be graded as 'sufficient' (4.0) or better only when at least two grades are 'sufficient' (4.0) or better.

(8) The time spent grading the dissertation normally is not to exceed six weeks. Only in extreme circumstances are deviations from this regulation acceptable, and the reasons must be recorded officially. The grade on the B.Sc. dissertation must be communicated in writing to the Examination Committee directly after the grade has been determined.

§ 34

Resubmission of the B.Sc. Dissertation

(1) A B.Sc. dissertation receiving a grade of '4.0' or better may not be resubmitted. The Examination Committee shall determine any exceptions.

(2) A B.Sc. dissertation that receives a failing grade as described in § 33 can be resubmitted once. However, changing the topic of the second B.Sc. dissertation within the period named in § 33, paragraph 4, sentence 4, is only permissible when the student did not exercise this option while preparing her or his first B.Sc. dissertation.

§ 35

Qualification and Non-Qualification for a B.Sc. Degree

- (1) A B.Sc. degree has been attained when
1. all continuous assessment examinations according to § 32 and the existing conditions governing the chosen discipline as enumerated in the annexes to these Examination Regulations
 2. the B.Sc. dissertation as described in § 33, as well as
 3. the Internship as described in § 8, paragraph 2
- have been successfully completed and 180 ECTS credits have been acquired.

(2) A B.Sc. degree has definitively not been attained when one of the requirements specified in (1), 1. through 3., has not been met and a repetition of the corresponding requirement is no longer possible.

(3) When a B.Sc. degree has definitively not been attained, the Examination Committee, upon receipt of an application from the student so affected and of the appropriate documentation, as well as of the certificate of exmatriculation, shall certify the failure to qualify for a degree and specify the tests passed, their grades and the ECTS credits accumulated.

§ 36

Certificate and Diploma Supplement

(1) If the student has acquired a B.Sc. degree, he or she receives a Certificate which contains the following information:

- name of the university and the designation of the Faculty
- surname, first name, date and place of birth of the student
- designation of the discipline studied, the major (where applicable), and details of the standard duration of study
- the names and grades of the modules taken together with the acquired credits and the assigned ECTS grades
- the names and grades of the passed continuous assessment examinations together with the acquired ECTS credits
- the topic of and the grade awarded to the B.Sc. dissertation together with the acquired ECTS credits and the prescribed ECTS grade
- the final grade together with the total number of ECTS credits acquired and the prescribed ECTS grade
- the time needed to complete the B.Sc. degree
- upon application by the student the results of continuous assessment examinations, where applicable, taken in additional disciplines
- the date of the last examination

- the signatures of the Chairperson of the Examination Committee supervising the student and of the Dean of the Faculty and
- the seal of the university.

The Certificate bears the date of the last continuous assessment examination taken in the B.Sc. degree programme.

(2) Together with the Certificate the graduate also receives a Diploma Supplement from the University. Besides the personal data and general information about the degree, the name and location of the University, the degree programme, the Supplement also includes detailed information about course unit credits and examination credits, as well as the corresponding grades. The Diploma Supplement shall bear the same date as the Certificate.

(3) The Certificate, pursuant to (1), and the Diploma Supplement, pursuant to (2), are issued in German. Upon request, the graduate also shall receive a copy of the Certificate and the Diploma Supplement in English.

(4) The Certificate of a completed B.Sc. degree is equivalent to a Certificate of General Higher Education Entrance Qualification, as defined in § 3, paragraph 4, of the Regulations Governing University Qualification (*Qualifikationsverordnung*). Accordingly, students with entrance qualifications for a polytechnic (*Fachhochschule*) automatically gain the entrance requirement by acquiring a B.Sc. degree.

§ 37

Bachelor's Diploma

(1) Upon receiving the Certificate and the Diploma Supplement, the graduate shall receive a Diploma with the same date as that of the Certificate and the Diploma Supplement. The Diploma shall certify the awarding of the B.Sc. degree as specified in § 3, paragraph 1. The Diploma shall bear the signatures of the Chairperson of the Examination Committee and the Dean of the Faculty of Engineering Sciences and the seal of the University of Duisburg-Essen.

(2) Upon application, the graduate shall receive an English version of the B.Sc. Diploma.

III. M.Sc. Examination Procedure

§ 38

Constituents of the Procedure

The M.Sc. examination procedure is composed of

1. the continuous assessment examinations in accordance with § 40 and the existing conditions governing the chosen discipline as enumerated in the annexes to these Examination Regulations
2. the M.Sc. dissertation as described in § 41.

§ 39

Registration for the First Continuous Assessment Examination in the Master's Programme

(1) Only those students may register for the first continuous assessment examination in a master's subject in the academic programme ISE who have previously registered at the University of Duisburg-Essen for the corresponding master's discipline in the academic programme ISE and who, in addition, at the time of the first registration for an examination, irrespective of the regulation in § 64, paragraph 2, No. 5, of the LU in the context of § 48, paragraph 5, sentences 2 through 4, have not been deregistered or who in accordance with § 52 of the LU have been admitted as a visiting students.

(2) The Examination Committee shall establish deadlines for the registration for the first continuous assessment examination in the M.Sc. programme. The application should include the following documentation:

1. A verification of the existence of the prerequisite mentioned in (1) and
 2. a statement as to whether the student has already definitively failed to qualify for a M.Sc. degree in the identical or a similar discipline or for a degree (*Diplomprüfung*) in a similar discipline and whether she or he is currently enrolled in another degree programme.
- (3) The authorisation to sit the examination is to be denied, if
- a) the prerequisite mentioned in (1) is not fulfilled or
 - b) the documentation is incomplete or
 - c) the student has definitively not attained degrees specified in paragraph 2, no. 2 or
 - d) the student is currently enrolled in one of the degree programmes mentioned in paragraph 2, no. 2.

§ 40

Continuous Assessment Examinations in Compulsory and Elective Subjects

The examinations in the compulsory and elective subjects of the respective subjects chosen will be conducted in accordance with § 10 and § 15 and according to the stipulations of the corresponding conditions related to the subject in the annexes to these Examination Regulations.

§ 41

M.Sc. Dissertation

(1) The M.Sc. dissertation is the part of the examination procedure that concludes the academic education in every M.Sc. discipline chosen for study in ISE. The purpose of the dissertation is to demonstrate, by the student's use of recognised scientific methods, that she or he is capable within a prescribed period of time of dealing independently with a problem from the field of engineering sciences.

(2) Permission to begin work on an M.Sc. dissertation shall be extended only to those candidates who have

1. accumulated at least 60 ECTS credits
2. satisfied the obligatory conditions, where necessary, set out in § 4 and § 5.

(3) A M.Sc. dissertation can be assigned without thematic restrictions anywhere within the Faculty of Engineering Sciences. The dissertation is normally proposed and supervised by a professor, a tenured member of the academic staff, or a member of the academic staff authorised to examine students independently (*Privatdozent*) from the Faculty of Engineering Sciences, or a visiting professor currently employed in the Faculty of Engineering Sciences or a visiting member of the academic staff who teaches subjects in ISE. The student has the right to suggest a dissertation topic. If the M.Sc. dissertation is to be done in another department of the University of Duisburg-Essen or at an institution outside of the University, the Examination Committee must approve this undertaking. In response to an application by a student, the Chairperson of the Examination Committee is responsible for ensuring that she or he be provided in reasonable time with a topic for the M.Sc. dissertation. The date of the issue of the topic for the M.Sc. dissertation is to be officially recorded by the Chairman of the Examination Committee issuing the topic.

(4) The time normally devoted to the M.Sc. dissertation is six months. In exceptional cases and in response to a written application to the Chairperson of the Examination Committee by the student at least two weeks before the expiration of the deadline, this period can be extended by up to six weeks. The topic and the purpose statement of the dissertation have to be of such a nature that the prescribed deadline for the project can be met. The topic can be changed only once and only within the first month following the date of issue of the topic.

(5) The M.Sc. dissertation can in adequately substantiated cases be completed as a group project when the test performance under examination for each student is so clearly demarcated by means of the identification of sections or pages or other objective criteria that the evaluation of the individual contributions can be made and the requirements in paragraph (1) fulfilled.

(6) The M.Sc. dissertation, normally of 40 to 60 pages, must be drafted in German or English and submitted to the Examination Committee in triplicate, printed and bound in DIN A4 format, on or before the deadline. Significant detailed results can, where applicable, be summarised in an annex. When submitting the M.Sc. dissertation, students must guarantee in writing that they alone wrote the dissertation or, in the case of a joint project, their own part of the dissertation, and used no other sources or auxiliary aids than those acknowledged and no quotations other than those cited. The date of submission should be registered officially. Should the M.Sc. dissertation not be submitted on time, it shall be graded as 'Insufficient' (5.0).

(7) The M.Sc. dissertation is normally to be graded, and the grade justified, by two examiners; the first examiner (advisor) should be the member of staff who proposed the topic of the dissertation. Exceptions to this rule must be approved by the Examination Committee. The Examination Committee appoints the second examiner. At least one of the examiners has to be a member of the Faculty of Engineering Sciences at the University of Duisburg-Essen. The individual grading is to be carried out in conformity with the grading scale in § 19, paragraph 1. The grade on the M.Sc. dissertation is an arithmetic average of the two examiners' grades as long as the difference is not more than 2.0. When, however, any difference is greater than 2.0, the Examination Committee shall appoint a third examiner to grade the dissertation. In this case the grade shall be computed by averaging the two best grades. However, the dissertation can be graded as 'sufficient' (4.0) or better only when at least two grades are 'sufficient' (4.0) or better.

(8) The time spent grading the dissertation normally is not to exceed six weeks. Only in extreme circumstances are deviations from this regulation acceptable; the reasons must be recorded officially. The grade on the M.Sc. dissertation must be communicated in writing to the Examination Committee directly after the grade has been determined.

§ 42

Resubmission of the M.Sc. Dissertation

(1) A M.Sc. dissertation receiving a grade of '4.0' or better may not be resubmitted. The Examination Committee shall determine any exceptions.

(2) An M.Sc. dissertation that has not been passed as described in § 41 can be resubmitted once. However, changing the topic of the second M.Sc. dissertation within the period named in § 41, paragraph 4, sentence 4, is only permissible when the student did not exercise this option while preparing her or his first M.Sc. dissertation.

§ 43

Qualification and Non-Qualification for an M.Sc. Degree

(1) an M.Sc. degree has been attained when

1. all the continuous assessment examinations in accordance with § 40 and the existing conditions governing the chosen subject as enumerated in the annexes to these Examination Regulations and
2. the M.Sc. dissertation as described in § 41

have been successfully completed and 120 ECTS credits accumulated.

(2) An M.Sc. degree has definitively not been attained when one of the requisite examination requirements specified in paragraph (1), nos. 1 and 2, has not been met and a repetition of the requirement is not possible.

(3) When an M.Sc. degree has definitively not been attained, the Examination Committee, upon receipt of an application from the student so affected and of the appropriate documentation, as well as of the certificate of exmatriculation, shall certify the failure to qualify for an M.Sc. degree and specify the tests passed, their grades and the ECTS credits accumulated.

§ 44

Certificate and Diploma Supplement

(1) When the student has passed all the requirements leading to the M.Sc. degree, she or he shall receive a Certificate that contains the following information:

- name of the University and designation of the Faculty
- surname, first name, date and place of birth of the student
- designation of the discipline, the major (where applicable), and details of the standard duration of study
- designations of and grades earned for passed modules with the ECTS credits acquired and the prescribed ECTS grades
- designations and grades of the passed continuous assessment examinations with the ECTS credits earned
- the topic of and the grade received for the M.Sc. dissertation, the ECTS credits earned and the prescribed ECTS Grade
- the final grade for the degree, the total ECTS credits earned and the prescribed ECTS grade
- the amount of time required to complete the degree
- upon application of the student the results, where applicable, on the examinations taken in the additional disciplines
- the date on which the last continuous assessment examination was passed
- the signatures of the Chairperson of the responsible Examination Committee and the Dean of the Faculty and
- the seal of the University.

The Certificate bears the date on which the last continuous assessment examination in the M.Sc. degree programme was passed.

(2) Together with the Certificate the graduate also receives a Diploma Supplement from the University. Besides personal data and general information about the degree, the name and location of the University granting the degree, the degree discipline and programme, the Supplement also includes detailed information about course unit credits and examination credits, as well as the corresponding grades and the ECTS credits earned. The Diploma Supplement shall bear the same date as that of the Certificate.

(3) The Certificate in accordance with paragraph 1 and the Diploma Supplement in accordance with paragraph 2 shall be issued in German. Upon application, the student shall receive, in addition, a copy of the Certificate and the Diploma Supplement in English.

§ 45

M.Sc. Diploma

(1) Upon receiving the Certificate and the Diploma Supplement, the graduate shall receive a Diploma bearing the same date as that of the Certificate. The Diploma shall certify the awarding of an M.Sc. degree as specified in § 3, paragraph 2. The Diploma shall bear the signatures of the Chairperson of the Examination Committee and the Dean of the Faculty of Engineering Sciences and the seal of the University of Duisburg-Essen.

(2) Upon application, the student shall receive, in addition, a copy of the Diploma in English.

IV. Final and Transitional Regulations

§ 46

Scope

(1) These Examination Regulations apply to all students who registered for the first time in the winter semester of 2008/09 or later at the University of Duisburg-Essen in a B.Sc. or an M.Sc. discipline in ISE in accordance with § 1.

(2) In each case § 5 applies to all applicants affected by the corresponding regulations who for the first time in the winter semester of 2009/10 or later wish to be registered at the University of Duisburg-Essen in a B.Sc. or M.Sc. discipline in ISE in accordance with § 1

§ 47

Transitional Regulations

(1) For students who prior to the winter semester 08/09 began their studies of a programme in ISE, the Examination Regulations of 19 October 2004 (*Gazette* of the University of Duisburg-Essen, 2 (2004), 351), last modified by the second revision of the Examination Regulations of 16 January 2008 (*Gazette*, 6 (2008), 73), still apply. Students can petition to have the new Examination Regulations apply in their studies; this petition is irrevocable. The course unit credits and examination credits acquired up to this point will be evaluated in accordance with § 13.

(2) Students in a double degree programme with a partner university will be registered up to and including the winter semester 2009/10 under the aegis of the Examination Regulations in ISE in the version as published in the *Official Bulletin of the University of Duisburg-Essen*, No. 35, 19 October 2004. Students in a double degree programme will be registered for the first time under the aegis of these Examination Regulations in the winter semester 2010/11.

(3) In accordance with the Examination Regulations of 19 October 2004 (*Gazette* of the University of Duisburg-Essen, 2 (2004), 351), last modified by the second revision of the Examination Regulations of 16 January 2008 (*Gazette*, 6 (2008), 73), first-time registrations can be made for the last time for

- examinations in engineering disciplines in the winter semester 2010/11
- the final dissertation in B.Sc. disciplines in the winter semester 2011/12
- the final dissertation in M.Sc. disciplines in the winter semester 2010/11.

(4) Where applicable, the resit examination opportunities in the framework of the examinations as referred to in the paragraph immediately preceding must be taken within a year after this deadline.

(5) In accordance with the Examination Regulations of 1 August 2003 (*Gazette* of the University of Duisburg-Essen, 1 (2003), 99), last modified by the Examination Regulations of 12 October 2006 (*Gazette*, 4 (2006), 595), examinations and resit examinations can be taken for the last time in the winter semester 2009/2010.

(6) Before the last examination dates mentioned in paragraph (3), the examiner in charge can decide that for course units offered prior to the enactment of these Examination Regulations in ISE, the contents of an examination will no longer be based upon the earlier course units in this discipline but rather upon the material covered in the equivalent course units in the academic year immediately preceding the examination, even when these course units differ only insignificantly in the number of contact hours involved per semester. Students must contact examiners for information on these matters.

§ 48

Enactment and Publication

These Examination Regulations shall come into force on the day after their publication in the *Gazette* of the *Official Bulletin of the University of Duisburg-Essen*. At the same time the Examination Regulations of 1 August 2003 (*Gazette* of the University of Duisburg-Essen, 1 (2003), 99), last modified by the Act of 12 October 2006 (*Gazette* of the University of Duisburg-Essen, 4 (2006), 595) and of 19 October 2004 (*Gazette* of the University of Duisburg-Essen, 2 (2004), 351), last modified by the second revision of the Regulations of 16 January 2008 (*Gazette* of the University of Duisburg-Essen, 6 (2008), 73) expire. § 47 remains unaffected.

Drawn up pursuant to the resolutions of 2 July 2008, 24 September 2008 and 8 April 2009 of the Faculty Council of the Faculty of Engineering Sciences at the University of Duisburg-Essen.

Duisburg and Essen, 07. July 2009

For the Rector
of the University Duisburg-Essen
signed for the Chancellor
Eva Lindenberg-Wendler

Annex 1:
Key to the Annexes 2, 3, 4 and 5

Sem.	=	semester of the course unit
P	=	compulsory course unit
WP	=	elective course unit
V	=	lecture
Ü	=	exercise
Pr.	=	internship
S	=	seminar
SWS	=	contact hours per week
Cr.	=	ECTS credits (1 cr corresponds to about 30 hours of work on the part of a student)
GP	=	grade points for an examination/course unit
CP	=	credit points for an examination/course unit (CP = Cr x GP)
GPA	=	grade point average for the module (Annex 2) or the B.Sc. degree (Annex 3) = Σ or all credit points acquired / Σ all credits acquired

Annex 2:
Calculation of a Module Grade: an Example

Sample Module 'XXX'

Examination / Course Unit	Cr	GP	CP	GPA
Component / Course Unit 1 in Module XXX	4	1,3	5,2	
Component / Course Unit 2 in Module XXX	6	2,7	16,2	
Component / Course Unit 3 in Module XXX	3	1,7	5,1	
Totals	13		26,5	2,0

In this module the imaginary student has accumulated 13 Cr (= ECTS credits) and achieved a grade point average of $26.5 / 13 = 2.038 = 2.0$ (rounded off to and clipped at the first decimal point).

Annex 3:
Calculation of a Final Grade: an Example

Examination Element	Cr	GP	CP	Module-Grade	Cr for Grade	Module Grade x Cr	GPA
Component/Course Unit 1 from Module 1	4	1.3	5.2				
Component / Course Unit 2 from Module 1	6	2.7	16.2				
Component / Course Unit 3 from Module 1	3	1.7	5.1				
Module 1	13		26.5	2.0	13	26	
Component / Course Unit from Module 2	9	1.3	11.7				
Module 2	9		11.7	1.3	9	11.7	
Component / Course Unit 1 from Module 3	3	2.3	6.9				
Component / Course Unit 2 from Module 3	3	2.0	6				
Component / Course Unit 3 from Module 3	2	3.3	6.6				
Component / Course Unit 5 from Module 3	3	3.3	9.9				
Module 3	11		29.4	2.6	11	28.6	
Component / Course Unit 1 from Module 4	7	3.0	21				
Component / Course Unit 2 from Module 4	5	4.0	20				
Module 4	12		41	3.4	12	40.8	
Component / Course Unit 1 from Module 5	2	3.3	6.6				
Component / Course Unit 2 from Module 5	3	4.0	12				
Component / Course Unit 3 from Module 5	6	3.0	18				
Component / Course Unit 4 from Module 5	2	2.7	5.4				
Module 5	13		42	3.2	13	41.6	
Component / Course Unit 1 from Module 6	4	2.0	8				
Component / Course Unit 2 from Module 6	5	3.3	16.5				
Component / Course Unit 3 from Module 6	3	4.0	12				
Module 6	12		36.5	3.0	12	36	
Internship	20						
Master's Dissertation	30	2.7	81	2.7	30	81	
Totals	120				100	265.7	2.6

Note: The calculation of the ECTS credits included in the final grade is derived from the sum of the total ECTS credits (in this example 120 Cr) minus the ungraded ECTS credits for the possible internship (in this imaginary case, 20 ECTS credits).

Annex 4.1:
Continuous Assessment Examinations in the Bachelor Degree Course
„Computer Engineering“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mathematics	1	Mathematics I1	4	2	0	0	8
	2	Mathematics I2	3	2	0	0	7
Natural Sciences	1	General Chemistry	2	1	0	0	4
	2	Physics	2	1	0	0	4
	2	Physics Lab	0	0	1	0	1
Mechanics	1	Mechanics I1	2	2	0	0	5
	2	Mechanics I2	2	2	0	0	5
Industrial Internship Seminar	1	Industrial Internship Seminar	0	0	0	1	1
Fundamentals of Electrical Engineering	1	Fundamentals of Electrical Engineering I1	2	2	0	0	5
	2	Fundamentals of Electrical Engineering I2	2	2	0	0	5
Fundamentals of Computer Engineering	1	Fundamentals of Computer Engineering 1	2	1	0	0	4
	1	Fundamentals of Computer Engineering 1 Lab	0	0	1	0	1
Fundamentals of Programming	2	Fundamentals of Programming	2	1	0	0	4
	2	Fundamentals of Programming Lab	0	0	1	0	1
Logical Design of Digital Systems	2	Logical Design of Digital Systems	2	1	0	0	4
	2	Logical Design of Digital Systems Lab	0	0	1	0	1
Diskrete Mathematik	3	Discrete Mathematics	2	2	0	0	5
Probability Calculus and Stochastics	3	Wahrscheinlichkeitsrechnung und Stochastik	2	1	0	0	3
Objectoriented Programming	3	Objektorientierte Programmierung	2	1	0	0	3
	3	Objektorientierte Programmierung Praktikum	0	0	1	0	1
Computer Based Engineering Mathematics	4	Computer Based Engineering Mathematics	1	1	0	0	2
	4	Computer Based Engineering Mathematics Lab Project	0	1	1	0	2
Advanced Programming Technology	4	Fortgeschrittene Programmieretechnik	2	1	0	0	3
Abstraktionskonzepte	3	Modellierungsmethoden der Informatik	2	1	0	0	4
	3	Programmierparadigmen	2	1	0	0	4
Rechnernetze und Sicherheit	3	Rechnernetze und Kommunikationssysteme	2	1	0	0	4
	4	Sicherheit in Kommunikationsnetzen	2	1	0	0	4
Computer Architecture	4	Rechnerarchitektur	2	2	0	0	5
Computer Architecture and Computer Networks Labs	5	Rechnerarchitektur Praktikum	0	0	2	0	2
	6	Computer Networks Lab	0	1	2	0	3
Internet-Technologie und Web-Engineering	6	Internet-Technologie und Web-Engineering	2	2	0	0	5
Datenstrukturen und Algorithmen	4	Datenstrukturen und Algorithmen	4	2	0	0	7
Software-Technik	5	Software-Technik	4	0	0	0	5
	5	Software-Technik Praktikum	0	0	2	0	2

Databases	5	Datenbanken	2	1	0	0	4
	5	Datenbanken Praktikum	0	0	1	0	1
Betriebssysteme	5	Betriebssysteme	3	1	0	0	5
Signals	3	Fundamentals of discrete LTI Systems	3	2	0	0	5
Embedded Systems	5	Embedded Systems	2	0	0	0	2
	5	Embedded Systems Lab	0	0	2	0	2
Elective	5	Wahlpflichtfach	2	1	0	0	3
Non-Technical Subjects B	3	Wissenschaftliches Arbeiten	0	0	0	1	1
	5	Betriebswirtschaft für Ingenieure	2	0	0	0	2
	4	Nicht-technischer Katalog B	0	0	0	3	4
Project	6	Praxisprojekt	0	0	5	0	6
Industrial Internship B	4	Industriepraktikum B Teil 1	-	-	-	-	3
	5	Industriepraktikum B Teil 2	-	-	-	-	3
Bachelor-Thesis	6	Bachelor-Abschlussarbeit	-	-	-	-	12
	6	Bachelor-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			68	40	20	5	180
			133 SWS				

Annex 4.2:
Continuous Assessment Examinations in the Bachelor Degree Course
„Computer Science and Communications Engineering”

Module	Sem	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mathematics	1	Mathematics I1	4	2	0	0	8
	2	Mathematics I2	3	2	0	0	7
Natural Sciences	1	General Chemistry	2	1	0	0	4
	2	Physics	2	1	0	0	4
	2	Physics Lab	0	0	1	0	1
Mechanics	1	Mechanics I1	2	2	0	0	5
	2	Mechanics I2	2	2	0	0	5
Industrial Internship Seminar	1	Industrial Internship Seminar	0	0	0	1	1
Fundamentals of Electrical Engineering	1	Fundamentals of Electrical Engineering I1	2	2	0	0	5
	2	Fundamentals of Electrical Engineering I2	2	2	0	0	5
Fundamentals of Computer Engineering	1	Fundamentals of Computer Engineering 1	2	1	0	0	4
	1	Fundamentals of Computer Engineering 1 Lab	0	0	1	0	1
Fundamentals of Programming	2	Fundamentals of Programming	2	1	0	0	4
	2	Fundamentals of Programming Lab	0	0	1	0	1
Logical Design of Digital Systems	2	Logical Design of Digital Systems	2	1	0	0	4
	2	Logical Design of Digital Systems Lab	0	0	1	0	1
Diskrete Mathematik	3	Discrete Mathematics	2	2	0	0	5
Computer Based Engineering Mathematics	4	Computer Based Engineering Mathematics	1	1	0	0	2
	4	Computer Based Engineering Mathematics Lab Project	0	1	1	0	2
Signals and Systems	3	Fundamentals of discrete LTI Systems	3	2	0	0	5
	4	Signals and Systems in Control Engineering	2	2	0	0	5
Internet-Technologie und Web-Engineering	6	Internet-Technologie und Web-Engineering	2	2	0	0	5
Databases	5	Datenbanken	2	1	0	0	4
	5	Datenbanken Praktikum	0	0	1	0	1
Fundamentals and Applications of LTI Systems	4	Analog Filters	2	1	0	0	5
	3	Theorie linearer Systeme	2	2	0	0	4
	4	Signalübertragung und Modulation	2	2	0	0	5
Operating Systems and Computer Networks	4	Operating Systems and Computer Networks	2	1	0	0	4
	6	Computer Networks Lab	0	1	2	0	3
Objectoriented Programming	3	Objektorientierte Programmierung	2	1	0	0	3
	3	Objektorientierte Programmierung Praktikum	0	0	1	0	1
Computer Hard- and Software	5	Struktur von Mikrorechnern	2	1	0	0	3
	3	Programmierparadigmen	2	1	0	0	4

Communication Technology	6	Microwave and RF-Technology	2	1	0	0	3
	6	Microwave and RF-Technology Lab	0	0	1	0	1
	6	Mobilkommunikationstechnik	2	1	0	0	3
Fundamentals of Software-Engineering	4	Grundlagen der Programmwurfstechnik	2	0	0	0	2
	4	Grundlagen der Programmwurfstechnik Projektpraktikum	0	0	2	0	2
Components and Circuits	5	Microelectronics	2	1	0	0	4
	5	Grundlagen der Elektronik	2	1	0	0	3
Embedded Systems	5	Embedded Systems	2	0	0	0	2
	5	Embedded Systems Lab	0	0	2	0	2
Elective	4	Wahlpflichtfach	2	1	0	0	3
Non-Technical Subjects B	3	Wissenschaftliches Arbeiten	0	0	0	1	1
	5	Betriebswirtschaft für Ingenieure	2	0	0	0	2
	3	Nicht-technischer Katalog B	0	0	0	3	4
Project	5	Praxisprojekt	0	0	5	0	6
Industrial Internship B	3	Industriepraktikum B Teil 1	-	-	-	-	3
	5	Industriepraktikum B Teil 2	-	-	-	-	3
Bachelor-Thesis	6	Bachelor-Abschlussarbeit	-	-	-	-	12
	6	Bachelor-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			67	43	19	5	180
			134 SWS				

Annex 4.3:
Continuous Assessment Examinations in the Bachelor Degree Course
„Automation and Control Engineering”

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mathematics	1	Mathematics I1	4	2	0	0	8
	2	Mathematics I2	3	2	0	0	7
Natural Sciences	1	General Chemistry	2	1	0	0	4
	2	Physics	2	1	0	0	4
	2	Physics Lab	0	0	1	0	1
Mechanics	1	Mechanics I1	2	2	0	0	5
	2	Mechanics I2	2	2	0	0	5
Fundamentals of Design Theory	2	Design Theory 1	2	2	0	0	5
Industrial Internship Seminar	1	Industrial Internship Seminar	0	0	0	1	1
Fundamentals of Electrical Engineering	1	Fundamentals of Electrical Engineering I1	2	2	0	0	5
	2	Fundamentals of Electrical Engineering I2	2	2	0	0	5
Fundamentals of Computer Engineering	1	Fundamentals of Computer Engineering 1	2	1	0	0	4
	1	Fundamentals of Computer Engineering 1 Lab	0	0	1	0	1
Fundamentals of Programming	2	Fundamentals of Programming	2	1	0	0	4
	2	Fundamentals of Programming Lab	0	0	1	0	1
Grundlagen dynamischer Systeme	3	Mathematik E3	3	2	0	0	6
	3	Theorie linearer Systeme	2	2	0	0	4
Computer Based Engineering Mathematics	4	Computer Based Engineering Mathematics	1	1	0	0	2
	4	Computer Based Engineering Mathematics Lab Project	0	1	1	0	2
Supplements to Fundamentals of Electrical Engineering	3	Fundamentals of Electrical Engineering I3	3	2	0	0	6
	3	Grundlagen der Elektrotechnik Praktikum (Teil 1)	0	0	1	0	1
	4	Grundlagen der Elektrotechnik Praktikum (Teil 2)	0	0	1	0	1
Thermodynamics	3	Thermodynamics 1	2	1,5	0	0	4
	3	Thermodynamics 1 Lab	0	0	0,5	0	1
	4	Thermodynamics 2	2	1,5	0	0	4
	4	Thermodynamics 2 Lab	0	0	0,5	0	1
Automatisierungs- / Regelungstechnik	4	Einführung in die Automatisierungstechnik	2	2	0	0	5
	5	Einführung in die Automatisierungstechnik Praktikum	0	0	1	0	1
	5	Regelungstechnik E	2	1	0	0	4
Fundamentals of Software-Engineering	4	Grundlagen der Programmwurfstechnik	2	0	0	0	2
	4	Grundlagen der Programmwurfstechnik Projektpraktikum	0	0	2	0	2
Objectoriented Programming	3	Objektorientierte Programmierung	2	1	0	0	3
	3	Objektorientierte Programmierung Praktikum	0	0	1	0	1

Computer Technology	5	Struktur von Mikrorechnern	2	1	0	0	3
	4	Operating Systems and Computer Networks	2	1	0	0	4
Modern Control Systems	6	Zustandsregelung	2	1	0	0	4
	6	Zustandsregelung Praktikum	0	0	1	0	1
Modellbildung und Simulation	5	Modelling and Simulation of Dynamic Systems	2	1	0	0	5
	5	Modelling and Simulation of Dynamic Systems Lab	0	0	1	0	1
Fundamentals of Measurement Technology	5	Einführung in die Messtechnik	2	1	0	0	3
	5	Einführung in die Messtechnik Praktikum	0	0	2	0	2
Cross Section Module Automation	5	Grundlagen der elektrischen Energietechnik	2	1	0	0	3
	5	Grundlagen der Elektronik	2	1	0	0	3
	5	Prozessautomatisierung	2	1	0	0	4
Elective	4	Wahlpflichtfach	2	1	0	0	3
Non-Technical Subjects B	3	Wissenschaftliches Arbeiten	0	0	0	1	1
	3	Betriebswirtschaft für Ingenieure	2	0	0	0	2
	6	Nicht-technischer Katalog B	0	0	0	3	4
Project	6	Praxisprojekt	0	0	5	0	6
Industrial Internship B	3	Industriepraktikum B Teil 1	-	-	-	-	3
	4	Industriepraktikum B Teil 2	-	-	-	-	3
Bachelor-Thesis	6	Bachelor-Abschlussarbeit	-	-	-	-	12
	6	Bachelor-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			66	42	20	5	180
			133 SWS				

Annex 4.4:
Continuous Assessment Examinations in the Bachelor Degree Course
„Electrical and Electronic Engineering”

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mathematics	1	Mathematics I1	4	2	0	0	8
	2	Mathematics I2	3	2	0	0	7
Natural Sciences	1	General Chemistry	2	1	0	0	4
	2	Physics	2	1	0	0	4
	2	Physics Lab	0	0	1	0	1
Mechanics	1	Mechanics I1	2	2	0	0	5
	2	Mechanics I2	2	2	0	0	5
Fundamentals of Design Theory	2	Design Theory 1	2	2	0	0	5
Industrial Internship Seminar	1	Industrial Internship Seminar	0	0	0	1	1
Fundamentals of Electrical Engineering	1	Fundamentals of Electrical Engineering I1	2	2	0	0	5
	2	Fundamentals of Electrical Engineering I2	2	2	0	0	5
Fundamentals of Computer Engineering	1	Fundamentals of Computer Engineering 1	2	1	0	0	4
	1	Fundamentals of Computer Engineering 1 Lab	0	0	1	0	1
Fundamentals of Programming	2	Fundamentals of Programming	2	1	0	0	4
	2	Fundamentals of Programming Lab	0	0	1	0	1
Grundlagen dynamischer Systeme	3	Mathematik E3	3	2	0	0	6
	3	Theorie linearer Systeme	2	2	0	0	4
Computer Based Engineering Mathematics	4	Computer Based Engineering Mathematics	1	1	0	0	2
	4	Computer Based Engineering Mathematics Lab Project	0	1	1	0	2
Supplements to Fundamentals of Electrical Engineering	3	Fundamentals of Electrical Engineering I3	3	2	0	0	6
	3	Grundlagen der Elektrotechnik Praktikum (Teil 1)	0	0	1	0	1
	4	Grundlagen der Elektrotechnik Praktikum (Teil 2)	0	0	1	0	1
Grundlagen Materie und Halbleiter	3	Einführung in die Werkstoffe	2	1	0	0	4
	4	Einführung in die Werkstoffe Praktikum	0	0	1	0	1
	4	Festkörperelektronik	3	1	0	0	5
Automatisierungs- / Regelungstechnik	4	Einführung in die Automatisierungstechnik	2	2	0	0	5
	5	Einführung in die Automatisierungstechnik Praktikum	0	0	1	0	1
	5	Regelungstechnik E	2	1	0	0	4
Electrical Power Engineering	3	Grundlagen der elektrischen Energietechnik	2	1	0	0	3
	5	Grundlagen der elektrischen Energietechnik Praktikum	0	0	1	0	1
	4	Elektrische Energieversorgungssysteme	2	1	0	0	3
	4	Elektrische Energieversorgungssysteme Praktikum	0	0	1	0	1
Communications Engineering	4	Signalübertragung und Modulation	2	2	0	0	5
	6	Mobilkommunikationstechnik	2	1	0	0	3

Objectoriented Programming	3	Objektorientierte Programmierung	2	1	0	0	3
	3	Objektorientierte Programmierung Praktikum	0	0	1	0	1
Fundamentals of Measurement Technology	5	Einführung in die Messtechnik	2	1	0	0	3
	5	Einführung in die Messtechnik Praktikum	0	0	2	0	2
Microwave and RF-Technology	6	Microwave and RF-Technology	2	1	0	0	3
	6	Microwave and RF-Technology Lab	0	0	1	0	1
Electronics	5	Elektronische Bauelemente	2	1	0	0	3
	6	Grundlagen elektronischer Schaltungen	2	1	0	0	3
Cross Section Module Electronic	5	Struktur von Mikrorechnern	2	1	0	0	3
	4	Introduction to Electromagnetic Compatibility	2	1	0	0	3
Elective	5	Wahlpflichtfach	2	1	0	0	3
Non-Technical Subjects B	3	Wissenschaftliches Arbeiten	0	0	0	1	1
	5	Betriebswirtschaft für Ingenieure	2	0	0	0	2
	6	Nicht-technischer Katalog B	0	0	0	3	4
Project	5	Praxisprojekt	0	0	5	0	6
Industrial Internship B	4	Industriepraktikum B Teil 1	-	-	-	-	3
	5	Industriepraktikum B Teil 2	-	-	-	-	3
Bachelor-Thesis	6	Bachelor-Abschlussarbeit	-	-	-	-	12
	6	Bachelor-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			69	44	19	5	180
			137 SWS				

Annex 4.5:
Continuous Assessment Examinations in the Bachelor Degree Course
„Mechanical Engineering”

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mathematics	1	Mathematics I1	4	2	0	0	8
	2	Mathematics I2	3	2	0	0	7
Natural Sciences	1	General Chemistry	2	1	0	0	4
	2	Physics	2	1	0	0	4
	2	Physics Lab	0	0	1	0	1
Mechanics	1	Mechanics I1	2	2	0	0	5
	2	Mechanics I2	2	2	0	0	5
Fundamentals of Design Theory	2	Design Theory 1	2	2	0	0	5
Industrial Internship Seminar	1	Industrial Internship Seminar	0	0	0	1	1
Fundamentals of Electrical Engineering	1	Fundamentals of Electrical Engineering I1	2	2	0	0	5
	2	Fundamentals of Electrical Engineering I2	2	2	0	0	5
Fundamentals of Computer Engineering	1	Fundamentals of Computer Engineering 1	2	1	0	0	4
	1	Fundamentals of Computer Engineering 1 Lab	0	0	1	0	1
Fundamentals of Programming	2	Fundamentals of Programming	2	1	0	0	4
	2	Fundamentals of Programming Lab	0	0	1	0	1
Höhere Mathematik	3	Mathematik M3	3	1	0	0	5
	4	Numerische Methoden für Ingenieure	2	2	0	0	5
Advanced Mechanics	3	Mechanics I3	2	2	0	0	4
	3	Mechanics I3 Lab	0	0	1	0	1
Thermodynamics	3	Thermodynamics 1	2	1,5	0	0	4
	3	Thermodynamics 1 Lab	0	0	0,5	0	1
	4	Thermodynamics 2	2	1,5	0	0	4
	4	Thermodynamics 2 Lab	0	0	0,5	0	1
Materials Science	3	Werkstoffkunde 1	4	0	0	0	5
	3	Werkstoffkunde 1 Praktikum	0	0	1	0	1
	4	Werkstoffkunde 2	2	0	0	0	3
	4	Werkstoffkunde 2 Praktikum	0	0	1	0	1
Design Theory	3	Design Theory 2	2	1	0	0	3
	4	Design Theory 3	2	1	0	0	3
Systemdynamics and Control Technique	5	Systemdynamics	1	1	0	0	2
	6	Control Engineering M	2	1	0	0	3
	6	Systemdynamics and Control Technique Lab	0	0	1	0	1
Fluids and Simulation	4	Fluid Mechanics	2	1	0	0	3
	5	Fluid Dynamics or Modelling and Simulation	2	1	0	0	4

CAD and Manufacturing	5	CAD	2	0	0	0	2
	5	CAD Praktikum	0	0	1	0	1
	4	Fertigungslehre	2	1	0	0	4
Energy and Process Engineering	6	Energietechnik	2	1	0	0	4
	5	Verfahrenstechnik	2	1	0	0	3
Analytical Practical Methods	5	Project Management	2	1	0	0	4
	4	Vibration Analysis	2	1	0	0	4
Mechatronics and Thermal Machines	5	Einführung in die Mechatronik und Signalanalyse	2	1	0	0	4
	6	Wärme-Kraft-Arbeitsmaschinen (ISE)	2	1	0	0	3
Elective	4	Wahlpflichtfach	2	1	0	0	3
Non-Technical Subjects B	3	Wissenschaftliches Arbeiten	0	0	0	1	1
	5	Betriebswirtschaft für Ingenieure	2	0	0	0	2
	6	Nicht-technischer Katalog B	0	0	0	3	4
Project	5	Praxisprojekt	0	0	5	0	6
Industrial Internship B	3	Industriepraktikum B Teil 1	-	-	-	-	3
	3	Industriepraktikum B Teil 2	-	-	-	-	3
Bachelor-Thesis	6	Bachelor-Abschlussarbeit	-	-	-	-	12
	6	Bachelor-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			73	40	14	5	180
			132 SWS				

Annex 4.6:
Continuous Assessment Examinations in the Bachelor Degree Course
„Metallurgy and Metal Forming“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mathematics	1	Mathematics I1	4	2	0	0	8
	2	Mathematics I2	3	2	0	0	7
Natural Sciences	1	General Chemistry	2	1	0	0	4
	2	Physics	2	1	0	0	4
	2	Physics Lab	0	0	1	0	1
Mechanics	1	Mechanics I1	2	2	0	0	5
	2	Mechanics I2	2	2	0	0	5
Fundamentals of Design Theory	2	Design Theory 1	2	2	0	0	5
Industrial Internship Seminar	1	Industrial Internship Seminar	0	0	0	1	1
Fundamentals of Electrical Engineering	1	Fundamentals of Electrical Engineering I1	2	2	0	0	5
	2	Fundamentals of Electrical Engineering I2	2	2	0	0	5
Fundamentals of Computer Engineering	1	Fundamentals of Computer Engineering 1	2	1	0	0	4
	1	Fundamentals of Computer Engineering 1 Lab	0	0	1	0	1
Fundamentals of Programming	2	Fundamentals of Programming	2	1	0	0	4
	2	Fundamentals of Programming Lab	0	0	1	0	1
Mathematics MT	4	Numerische Methoden für Ingenieure	2	2	0	0	5
	4	Statistics for Engineers	2	1	0	0	3
Computer Based Engineering Mathematics	4	Computer Based Engineering Mathematics	1	1	0	0	2
	4	Computer Based Engineering Mathematics Lab Project	0	1	1	0	2
Advanced Mechanics	3	Mechanics I3	2	2	0	0	4
	3	Mechanics I3 Lab	0	0	1	0	1
Thermodynamics	3	Thermodynamics 1	2	1,5	0	0	4
	3	Thermodynamics 1 Lab	0	0	0,5	0	1
	4	Thermodynamics 2	2	1,5	0	0	4
	4	Thermodynamics 2 Lab	0	0	0,5	0	1
Materials Science	3	Werkstoffkunde 1	4	0	0	0	5
	3	Werkstoffkunde 1 Praktikum	0	0	1	0	1
	4	Werkstoffkunde 2	2	0	0	0	3
	4	Werkstoffkunde 2 Praktikum	0	0	1	0	1
Design Theory	3	Design Theory 2	2	1	0	0	3
	4	Design Theory 3	2	1	0	0	3
Steelmaking	5	Stahlerzeugung 1	2	1	0	0	3
	6	Stahlerzeugung 2	2	1	0	0	3
	6	Stahlerzeugung 2 Praktikum	0	0	1	0	1

Metal Physics	3	Grundlagen der Metallkunde 1	2	0	0	0	2
	4	Grundlagen der Metallkunde 2	2	0	0	0	2
	4	Grundlagen der Metallkunde 2 Praktikum	0	0	1	0	1
Metal Forming	5	Umformtechnik 1	2	1	0	0	4
	5	Umformtechnik 1 Praktikum	0	0	1	0	1
	6	Umformtechnik 2	2	1	0	0	4
	6	Umformtechnik 2 Praktikum	0	0	1	0	1
Metallurgy	4	Grundlagen der Metallurgie	2	1	0	0	4
	6	NE-Metallerzeugung	2	1	0	0	3
	5	Eisengewinnung	2	1	0	0	3
Technological Fundamentals	5	Wärmeübertragung	2	0	0	0	2
	6	Grundlagen der Hochtemperaturtechnik	2	1	0	0	3
	5	Grundlagen der Umformtechnik	2	1	0	0	3
Elective	5	Wahlpflichtfach	2	1	0	0	3
Non-Technical Subjects B	3	Wissenschaftliches Arbeiten	0	0	0	1	1
	5	Betriebswirtschaft für Ingenieure	2	0	0	0	2
	3	Nicht-technischer Katalog B	0	0	0	3	4
Project	5	Praxisprojekt	0	0	5	0	6
Industrial Internship B	3	Industriepraktikum B Teil 1	-	-	-	-	3
	5	Industriepraktikum B Teil 2	-	-	-	-	3
Bachelor-Thesis	6	Bachelor-Abschlussarbeit	-	-	-	-	12
	6	Bachelor-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			74	40	17	5	180
			136 SWS				

Annex 5.1.1:
Continuous Assessment Examinations in the Master Degree Course
„Computer Engineering (Reliable Systems)“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Distributed Systems	1	Distributed Systems	3	1	0	0	6
Pattern and Component based Software Development	2	Muster- und Komponentenbasierte Software-Entwicklung	2	2	0	0	6
Theoretical Computer Science	2	Theoretische Informatik	2	2	0	0	6
Reliable Systems 1	1	Katalog Verlässliche Systeme 1	2	2	0	0	6
	2	Katalog Verlässliche Systeme 1	2	2	0	0	6
	2	Katalog Verlässliche Systeme 1	2	2	0	0	6
Reliable Systems 2	1	Katalog Verlässliche Systeme 2	2	2	0	0	6
	1	Katalog Verlässliche Systeme 2	2	2	0	0	6
	2	Katalog Verlässliche Systeme 2	2	2	0	0	6
Master-Project	3	Master-Seminar	0	0	0	2	4
	3	Anwendungsbezogenes, studentisches Wissenschaftsprojekt (Master-Projekt)	0	0	12	0	15
Non-technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	4	5
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	1	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			25	20	12	6	120 Cr.
			63 SWS				

Annex 5.1.2:

**Continuous Assessment Examinations in the Master Degree Course
„Computer Engineering (Interactive Systems and Visualization)“**

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Distributed Systems	1	Distributed Systems	3	1	0	0	6
Pattern and Component based Software Development	2	Muster- und Komponentenbasierte Software-Entwicklung	2	2	0	0	6
Theoretical Computer Science	2	Theoretische Informatik	2	2	0	0	6
Interactive Systems and Visualization 1	1	Katalog Interaktive Systeme und Visualisierung 1	2	2	0	0	6
	2	Katalog Interaktive Systeme und Visualisierung 1	2	2	0	0	6
	2	Katalog Interaktive Systeme und Visualisierung 1	2	2	0	0	6
Interactive Systems and Visualization 2	1	Katalog Interaktive Systeme und Visualisierung 2	2	2	0	0	6
	1	Katalog Interaktive Systeme und Visualisierung 2	2	2	0	0	6
	2	Katalog Interaktive Systeme und Visualisierung 2	2	2	0	0	6
Master-Project	3	Master-Seminar	0	0	0	2	4
	3	Anwendungsbezogenes, studentisches Wissenschaftsprojekt (Master-Projekt)	0	0	12	0	15
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	4	5
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	1	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			25	20	12	6	120 Cr.
			63 SWS				

Annex 5.2:
Continuous Assessment Examinations in the Master Degree Course
„Computer Science and Communications Engineering)“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Numerik	1	Numerical Mathematics	2	2	0	0	6
Theoretische Nachrichtentechnik	1	Theorie statistischer Signale	2	2	0	0	5
	1	Digital Filters	2	1	0	0	3
Advanced Communication	1	Kommunikationsnetze	2	2	0	0	5
	3	Advanced Mobile Communications	2	1	0	0	5
	2	Mobilkommunikationsgeräte	2	1	0	0	4
Digital Systems	1	Distributed Systems	3	1	0	0	6
	1	Test und Zuverlässigkeit digitaler Systeme	2	1	0	0	4
Transmission Technology	3	Radio Propagation Channels	2	1	0	0	4
	2	Übertragungstechnik	2	2	0	0	5
Computer Systems	2	Advanced Computer Architecture	2	1	0	0	4
	2	Echtzeitsysteme	3	1	0	0	5
Kodierung	2	Coding Theory	2	1	0	0	4
	3	Mehrdimensionale Signale	2	1	0	0	4
CSCW and Software Engineering	3	CSCW and Software Engineering	2	0	0	0	3
	3	CSCW and Software Engineering Lab	0	0	2	0	3
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	2	Wahlpflichtfach 1	2	1	0	0	4
	2	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			38	21	2	6	120 Cr.
			67 SWS				

Annex 5.3:
Continuous Assessment Examinations in the Master Degree Course
„Automation and Control Engineering“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Vector Analysis and Advanced Numerics	1	Mathematik E4	2	1	0	0	5
	1	Numerical Mathematics	2	2	0	0	6
	2	Algorithmische Numerik	3	1	0	0	6
Stochastische Methoden in der Automatisierungstechnik	1	Theorie statistischer Signale	2	2	0	0	5
	2	State and Parameter Estimation	2	1	0	0	4
Advanced Control 1	1	Nonlinear Control Systems	2	1	0	0	4
	1	Nonlinear Control Systems Lab	0	0	1	0	1
	2	Regelungstechnisches Aufbaupraktikum	0	0	3	0	4
Advanced Control 2	2	Advanced System and Control Theory	2	1	0	0	4
	3	Robust Control	2	1	0	0	4
Advanced Automation	2	Human-Machine-Systems	3	0	0	0	4
	3	Fehlerdiagnose und Fehlertoleranz in technischen Systemen	2	1	0	0	4
Fluiddynamik	3	Fluid Dynamics	2	1	0	0	4
Computer Engineering for Automation	1	Test und Zuverlässigkeit digitaler Systeme	2	1	0	0	4
	3	Distributed Systems	3	1	0	0	6
	2	Echtzeitsysteme	3	1	0	0	5
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	2	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			38	18	4	6	120 Cr.
			66 SWS				

**Annex 5.4.1:
Continuous Assessment Examinations in the Master Degree Course
„Electrical and Electronic Engineering (Communications Engineering)“**

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Erweiterte Feldtheorie	1	Mathematik E4	2	1	0	0	5
	1	Theoretische Elektrotechnik 1	2	2	0	0	6
	2	Theoretische Elektrotechnik 2	2	2	0	0	6
Communication Networks and Mobile Communication Networks	1	Kommunikationsnetze	2	2	0	0	5
	2	Mobilkommunikationsgeräte	2	1	0	0	4
	3	Optical Communications Technology or Bildsignaltechnik	2	1	0	0	4
Theoretical Communications Engineering	1	Theorie statistischer Signale	2	2	0	0	5
	2	Coding Theory	2	1	0	0	4
	2	Übertragungstechnik	2	2	0	0	5
Grundsaltungen	2	Elektronische Schaltungen	2	1	0	0	4
	2	Elektronische Schaltungen Praktikum	0	0	1	0	1
Microwave Theory and Techniques	3	Microwave Theory and Techniques	2	1	0	0	4
	3	Microwave Theory and Techniques Lab	0	0	1	0	1
Cross Section Module CE	3	Distributed Systems	3	1	0	0	6
	2	Advanced Computer Architecture	2	1	0	0	4
	1	Numerical Mathematics	2	2	0	0	6
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	3	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	23	2	6	120 Cr.
			66 SWS				

Annex 5.4.2:

**Continuous Assessment Examinations in the Master Degree Course
„Electrical and Electronic Engineering (Power and Automation)”**

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Feldtheorie	1	Mathematik E4	2	1	0	0	5
	1	Theoretische Elektrotechnik 1	2	2	0	0	6
Advanced Control Technology	3	Nonlinear Control Systems	2	1	0	0	4
	3	Nonlinear Control Systems Lab	0	0	1	0	1
Modern Control Systems	2	Zustandsregelung	2	1	0	0	4
	2	Zustandsregelung Praktikum	0	0	1	0	1
Modellbildung und Simulation	3	Modelling and Simulation of Dynamic Systems	2	1	0	0	5
	3	Modelling and Simulation of Dynamic Systems Lab	0	0	1	0	1
Power Grids	2	Operation and Control of Power Networks	2	1	0	0	4
	3	Electrical System and Networks Lab	0	0	2	0	2
	3	Netzberechnung	2	1	0	0	4
High Voltage Engineering	1	Grundlagen der Hochspannungstechnik	2	1	0	0	5
	2	Betriebsmittel der Hochspannungstechnik	2	1	0	0	4
	2	Leistungselektronik	2	1	0	0	4
Grundsaltungen	2	Elektronische Schaltungen	2	1	0	0	4
	2	Elektronische Schaltungen Praktikum	0	0	1	0	1
Cross Section Module PA	1	Numerical Mathematics	2	2	0	0	6
	2	Advanced Computer Architecture	2	1	0	0	4
	1	Theorie statistischer Signale	2	2	0	0	5
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	2	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			34	20	6	6	120 Cr.
			66 SWS				

Annex 5.5.1:
Continuous Assessment Examinations in the Master Degree Course
„Mechanical Engineering (General Mechanical Engineering)”

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Production Technology	1	Machine Lab	0	0	3	0	4
	3	Fertigungstechnik	2	1	0	0	5
Fluids and Combustion	1	Computational Fluid Dynamics	2	1	0	0	5
	1	Combustion Science	2	1	0	0	5
Advanced Engineering	2	Control Theory	3	1	0	0	5
	2	Control Theory Lab	0	0	1	0	1
	2	Computergestützte Berechnungsmethoden	0	0	4	0	5
	3	Production Management	2	1	0	0	4
Advanced Sensors	3	Sensoren für Fortgeschrittene - Anwendungen, Schnittstellen und Signalverarbeitung	2	1	0	0	4
Fundamentals and Methods	2	Dynamik komplexer Systeme	2	1	0	0	3
	2	Dynamik komplexer Systeme Lab	0	0	1	0	1
	2	Wärme- und Stoffübertragung	2	1	0	0	4
Production and Materials	1	Katalog Production and Materials	2	1	0	0	4
	3	Katalog Production and Materials	2	1	0	0	4
Advanced Energy and Process Engineering	1	Katalog Advanced Energy and Process Engineering	2	1	0	0	4
	2	Katalog Advanced Energy and Process Engineering	2	1	0	0	4
Mechatrical Applications	2	Katalog Mechatronics	2	1	0	0	4
	3	Katalog Mechatronics	2	1	0	0	4
Non-Technical Subjects M	1	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	2	Wahlpflichtfach 1	2	1	0	0	4
	3	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	17	9	6	120 Cr.
			67 SWS				

Annex 5.5.2:
Continuous Assessment Examinations in the Master Degree Course
„Mechanical Engineering (Mechatronics)“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Production Technology	1	Machine Lab	0	0	3	0	4
	3	Fertigungstechnik	2	1	0	0	5
Fluids and Combustion	1	Computational Fluid Dynamics	2	1	0	0	5
	1	Combustion Science	2	1	0	0	5
Advanced Engineering	2	Control Theory	3	1	0	0	5
	2	Control Theory Lab	0	0	1	0	1
	2	Computergestützte Berechnungsmethoden	0	0	4	0	5
	3	Production Management	2	1	0	0	4
Advanced Sensors	3	Sensoren für Fortgeschrittene - Anwendungen, Schnittstellen und Signalverarbeitung	2	1	0	0	4
System Dynamics	1	Katalog System Dynamics	2	1	0	0	4
	2	Katalog System Dynamics	2	1	0	0	4
Mathematical Methods	1	Katalog Mathematical Methods	2	1	0	0	4
	2	Katalog Mathematical Methods	2	1	0	0	4
Mechatrical Applications	2	Katalog Mechatrical Applications	2	1	0	0	4
	3	Katalog Mechatrical Applications	2	1	0	0	4
Selected Topics M	2	Katalog Selected Topics M	2	1	0	0	4
	3	Katalog Selected Topics M	2	1	0	0	4
Non-Technical Subjects M	1	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	2	Wahlpflichtfach 1	2	1	0	0	4
	3	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	17	8	6	120 Cr.
			66 SWS				

Annex 5.5.3:
Continuous Assessment Examinations in the Master Degree Course
„Mechanical Engineering (Production and Logistics)“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Production Technology	1	Machine Lab	0	0	3	0	4
	3	Fertigungstechnik	2	1	0	0	5
Fluids and Combustion	1	Computational Fluid Dynamics	2	1	0	0	5
	1	Combustion Science	2	1	0	0	5
Advanced Engineering	2	Control Theory	3	1	0	0	5
	2	Control Theory Lab	0	0	1	0	1
	2	Computergestützte Berechnungsmethoden	0	0	4	0	5
	3	Production Management	2	1	0	0	4
Advanced Sensors	3	Sensoren für Fortgeschrittene - Anwendungen, Schnittstellen und Signalverarbeitung	2	1	0	0	4
Logistics and Material Flow	1	Katalog Logistics and Material Flow	2	1	0	0	4
	2	Katalog Logistics and Material Flow	2	1	0	0	4
Product Engineering	1	Katalog Product Engineering	2	1	0	0	4
	2	Katalog Product Engineering	2	1	0	0	4
Production Technology and Management	3	Katalog Production Technology and Management	2	1	0	0	4
	3	Katalog Production Technology and Management	2	1	0	0	4
Selected Topics PL	2	Katalog Selected Topics PL	2	1	0	0	4
	3	Katalog Selected Topics PL	2	1	0	0	4
Non-Technical Subjects M	1	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	2	Wahlpflichtfach 1	2	1	0	0	4
	2	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	17	8	6	120 Cr.
			66 SWS				

Annex 5.5.4:

**Continuous Assessment Examinations in the Master Degree Course
„Mechanical Engineering (Energy and Environmental Engineering)“**

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Production Technology	1	Machine Lab	0	0	3	0	4
	3	Fertigungstechnik	2	1	0	0	5
Fluids and Combustion	1	Computational Fluid Dynamics	2	1	0	0	5
	1	Combustion Science	2	1	0	0	5
Advanced Engineering	2	Control Theory	3	1	0	0	5
	2	Control Theory Lab	0	0	1	0	1
	2	Computergestützte Berechnungsmethoden	0	0	4	0	5
	3	Production Management	2	1	0	0	4
Advanced Sensors	3	Sensoren für Fortgeschrittene - Anwendungen, Schnittstellen und Signalverarbeitung	2	1	0	0	4
Process Engineering and Design	1	Katalog Process Engineering and Design	2	1	0	0	4
	2	Katalog Process Engineering and Design	2	1	0	0	4
Energy Engineering	2	Katalog Energy Engineering	2	1	0	0	4
	3	Katalog Energy Engineering	2	1	0	0	4
Environmental Engineering	2	Katalog Environmental Engineering	2	1	0	0	4
	3	Katalog Environmental Engineering	2	1	0	0	4
Selected Topics EEE	2	Katalog Selected Topics EEE	2	1	0	0	4
	3	Katalog Selected Topics EEE	2	1	0	0	4
Non-Technical Subjects M	1	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	2	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	17	8	6	120 Cr.
			66 SWS				

Annex 5.6:
Continuous Assessment Examinations in the Master Degree Course
„Metallurgy and Metal Forming“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Testing of Metallic Materials	1	Testing of Metallic Materials	2	1	0	0	4
	1	Testing of Metallic Materials Lab	0	0	1	0	1
Mathematics and Mechanics	1	Tensor Calculus	2	2	0	0	6
	3	Continuum Mechanics	2	0	0	0	4
Thermodynamics and Transport Phenomena	2	Die Methode der finiten Elemente 1	1	2	0	0	4
	2	Wärme- und Stoffübertragung	2	1	0	0	4
	1	Thermodynamik und Kinetik metallischer Reaktionen	2	1	0	0	4
Computer Application in Material Technology	3	Schwingungsanalyse metallurgischer Anlagen	2	1	0	0	4
	1	Prozesssimulation in der Metallurgie und Umformtechnik	2	1	0	0	4
	1	Prozesssimulation in der Metallurgie und Umformtechnik Praktikum	0	0	1	0	1
	3	Computer Application in Metallurgy and Metal Forming	2	0	0	0	4
Advanced Material Science	3	Wärmebehandlung metallischer Werkstoffe	2	1	0	0	4
	3	Wärmebehandlung metallischer Werkstoffe Praktikum	0	0	1	0	1
	2	Metallkunde und Metallphysik	2	1	0	0	4
	2	Metallkunde und Metallphysik Praktikum	0	0	1	0	1
Production Engineering	2	Plastomechanik und Umformverfahren	2	1	0	0	4
	2	Plastomechanik und Umformverfahren Praktikum	0	0	1	0	1
	1	Schweißtechnische Fertigungsverfahren	2	1	0	0	4
	1	Schweißtechnische Fertigungsverfahren Praktikum	0	0	1	0	1
Metallurgical Technology	2	Gießen und Erstarren von Stahl	2	2	0	0	5
	2	Recycling of Oxidic and Metallic Materials	2	1	0	0	4
	2	Recycling of Oxidic and Metallic Materials Lab	0	0	1	0	1
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	2	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	19	7	6	120 Cr.
			67 SWS				

Annex 5.7:
Continuous Assessment Examinations in the Master Degree Course
„Computational Mechanics“,

Modul3	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Mechanical Foundations	1	Continuum Mechanics	2	2	0	0	7
	2	Thermodynamics of Materials	2	2	0	0	7
Finite Element Method	2	Finite Element Method Foundation	2	2	0	0	7
	3	Nonlinear Finite Element Method	2	2	0	0	7
Mathematical Foundations	1	Tensor Calculus	2	2	0	0	7
	1	Introduction to Numerical Methods	2	2	0	0	7
Computer Languages for Engineers	1	Computer Languages for Engineers	2	2	0	0	5
Testing of Metallic Materials	1	Testing of Metallic Materials	2	1	0	0	4
	1	Testing of Metallic Materials Lab	0	0	1	0	1
Electives I	2	Wahlpflichtfach I – 1	2	2	0	0	5
	2	Wahlpflichtfach I – 2	2	2	0	0	5
	2	Wahlpflichtfach I – 3	2	2	0	0	5
Electives II	3	Wahlpflichtfach II – 1	2	2	0	0	5
	3	Wahlpflichtfach II – 2	2	2	0	0	5
	3	Wahlpflichtfach II – 3	2	2	0	0	5
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			28	27	1	6	120
			62 SWS				

Annex 5.8:
Continuous Assessment Examinations in the Master Degree Course
„Management and Technology of Water and Waste Water“

Module	Sem.	Course	SWS				Cr.
			V	Ü	Pr.	S	
Basics of Water Technology and Fluid Dynamics	1	Water – Natural Science Fundamentals	2	1	0	0	4
	2	Computational Fluid Dynamics	2	2	0	0	5
Practical Course Water Technology	2	Practical Course Water Technology	0	0	3	0	4
Computergestützte Berechnungsmethoden	2	Computergestützte Berechnungsmethoden	0	0	4	0	5
Production Management	3	Production Management	2	1	0	0	4
Advanced Control Engineering	2	Control Theory or Notlauf und Diagnose mechatronischer Systeme	3 or 2	1	0	0 or 1	5
	2	Control Theory Lab or Notlauf und Diagnose Praktikum	0	0	1	0	1
Process Engineering	1	Mechanische Verfahrenstechnik in der Wasseraufbereitung	2	1	0	0	4
	2	Thermische Verfahrens- und Prozesstechnik	2	1	0	0	4
Water Treatment: Conventional and Advanced Processes	2	Water Treatment	2	1	0	0	4
	3	Membrane Technology for Water Treatment	2	1	0	0	4
Storm and Waste Water: Technology of Sewer Systems and Treatment Technologies	1	Siedlungswasserwirtschaft	2	1	0	0	4
	1	Waste Water Treatment	2	1	0	0	4
Management and Controlling	1	Management und Controlling in der Wasserversorgung und -entsorgung	2	1	0	0	4
	1	Quality Management in Water Supply	2	1	0	0	4
Water Management	2	River Basin Management	2	0	0	0	3
	3	Wassergewinnung	2	0	0	0	3
Industrial Course in Water Management and Technology	3	Industriepraktikum für Management und Technologie in der Wasserwirtschaft	-	-	-	-	4
Non-Technical Subjects M	3	Nicht-technischer Katalog M	0	0	0	6	8
Wahlpflichtmodul	1	Wahlpflichtfach 1	2	1	0	0	4
	3	Wahlpflichtfach 2	2	1	0	0	4
	3	Wahlpflichtfach 3	2	1	0	0	4
Master-Thesis	4	Master-Abschlussarbeit	-	-	-	-	27
	4	Master-Abschlussarbeit Kolloquium	-	-	-	-	3
Total			35	16	8	6	120 Cr.
			65 SWS				