OTTO VON GUERICKE
UNIVERSITÄT
MAGDEBURG

Department for Electrical Engineering and Information Technology

Study and Examination Regulations

for the Master program

Medical Systems Engineering

from January 10, 2018

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The German version is legally binding!!!

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I. General part

§ 1
Area of application

The present study and examination regulations specify the purpose, the content and the structure as well as the examinations and the completion of the master's program

Medical Systems Engineering

at the Faculty of Electrical Engineering and Information Technology at the Otto von Guericke University Magdeburg in cooperation with the Faculty of Mechanical Engineering, the Faculty of Computer Science, the Faculty of Process and Systems Engineering, the Faculty of Mathematics, the Faculty of Natural Sciences, the Medical Faculty.

§ 2
Purpose of study

(1) The aim of the study is to acquire a broad but at the same time detailed and critical understanding of the expert knowledge and to get the ability to work independently according to scientific methods, to independently familiarize oneself with the manifold tasks of the fields of application, research or teaching and to be able to cope with the frequently changing tasks which occur in professional life.

The content of the Master's program complements the previous Bachelor's program and goes beyond it. The students gain the ability to critically question opinions in their area of expertise, solve existing problems in a scientifically structured way, taking into account adjacent disciplines, and represent their solution or convey their knowledge towards specialist colleagues and laypersons. They are able to creatively develop their field of expertise beyond the current state and to acquire new knowledge themselves. Even on the basis of limited information, graduates can make scientifically sound decisions, taking social and ethical insights into account. They are able to take responsibility in a team.

(2) Course specific purposes are:

Professional competences: The graduates

- have sound technical knowledge in the field of modern medical technology, especially the technologies for diagnostics and therapy
- have a basic understanding of medicine and are able to translate medical questions into technological requirements
- have an overview of the requirements of medicine to the natural sciences and technology
- are able to design technical systems based on medical requirements and implement them in collaboration with industrial partners
- have an understanding of the burdens and side effects of the technologies on the human organism and have an overview of the legal requirements
- know organizational and documentation structures of the health care system
- are able to independently solve scientific tasks by means of suitable methods and to present the results of their work both in scientific and in popular science form in different media (journals, presentation, internet)
- are prepared on the basis of their competences for a flexible employment in different professional fields of medical engineering
- have an overview of the current scientific topics of medical engineering and are prepared for a further scientific career (PhD)

Social competences: The graduates

- are able to communicate with experts about the contents and problems of medical engineering also in foreign languages
- are familiar with good scientific practice
- are able to work individually and as a member of international groups

- are prepared for academic work by having a sufficient practical relevance to professional life, especially in industry, as well as by their scientific competence
- can grasp complex planning contexts in a structured manner and realize their implementation professionally with methods of project management considering business aspects

Occupational fields: The completion of this master qualifies especially for the occupational fields:

- Development engineer in the medical engineering industry
- Engineer in the hospital, in the health service, in the medical industry
- Scientists in industrial, academic and clinical research in medical engineering, computer science and neuroscience
- Consultant for embedded medical systems and equipment
- Product management and sales of medical systems and equipment
- Self-employment in the field of medical engineering and medical informatics

§ 3
Academic degree

After successfully passed examinations, Otto von Guericke University awards the academic degree

„Master of Science"
abbreviated: **„M.Sc."**

II. Scope and process of the study

§ 4
Admission to study / Admission requirements

(1) Requirements for access to the master's program are:

a) The applicant has a bachelor's degree, a university degree, or a comparable degree from a state or state-recognized university of cooperative education, a Magister or a degree course in medical engineering, electrical engineering, information technology, computer science, physics, mathematics engineering or in a technically related direction.

b) A completed degree must have:

- at least 20 CP (ECTS) in mathematics
- at least 15 CP (ECTS) in physics / medical physics
- at least 20 CP (according to ECTS) in the field of electrical engineering and information technology / electronics
- at least 10 CP (ECTS) in computer science / programming
- at least 10 CP (ECTS) in the field of medicine / biology..

c) The particular suitability of paragraphs 2 to 5 shall be demonstrated.

(2) The particular suitability is determined on the basis of the result of the final examination in accordance with paragraph 1a and requires that the previous studies have been awarded at least the overall grade "good".

(3) By way of derogation from paragraph 2, the special suitability is assumed if the final degree at the time of application is not yet available, but at least 150 credit points (CP) for six-semester bachelor's degrees or 180 CP for seven-semester bachelor's degrees are attested and the average grade determined from the examination results is at least "2.5".

(4) Admission is to be refused if the applicant has definitively failed examinations in the chosen course of study at a university or an equivalent university within the scope of the constitution or is in an appropriate examination procedure.

(5) Applicants must have sufficient knowledge of the English language. As proof, one of the following certificates is accepted:

- TOEFL (Test of English as a Foreign Language) at least 80 points (internet based TOEFL)
- IELTS (International English Language Testing System), number of points at least 6,5
- Or similar evidence corresponding to level B2 of the Common European Framework of Reference for Languages (CEFR).

(6) The certificates and confirmations must be submitted in German or English or in a corresponding translation by sworn translators.

(7) The decision whether the admission requirements have been met is made by the Examination Board.

(8) Admission is only possible if no more than 30 CPs are missing from the CP listed under § 4 (1b). The admission is then involved with conditions that have to be fulfilled within two semesters. The conditions imposed by the Examination Board are to be effected on time, otherwise they will be de-registered at the end of the second semester. Until the fulfilment of the requirements, enrolment is made conditionally.

§ 5
Start of study and duration of study

(1) Enrollment is possible in the summer and winter semester. The enrollment is recommended for the summer semester. The course offer is oriented accordingly.

(2) The Master's program is designed to complete the course of study, including the preparation of the Master's thesis with defense, for a standard duration of four semesters.

(3) The standard period of study, including the Master's thesis, is 4 semesters

§ 6
Structure and scope of study

(1) This consecutive Master's Degree is a full-time, presence study program that is assigned to the "more research-oriented" profile type.

(2) The course is modular. Modules are usually completed with an exam.

(3) The study effort is described with Credit Points (CP). It amounts to a total of 120 CP, which are divided into the compulsory, elective, and project areas as well as the master's thesis. For a successful completion of the master's program, a total of at least 300 CP must be proven in total with the preliminary study.

The workload is 30 CP per semester.

The specified credit points describe the study effort, which i. a. from the participation in the course, the preparation and postprocessing of the events, the independent processing and deepening of the material and the proof of the services provided. 1 CP equals an expenditure of approx. 30 working hours.

(4) The content of the study can be found in the attached study and examination plans, the compulsory elective module catalog and the module description.

(5) The examinations for compulsory modules must be taken by the end of the semester specified in the examination plan. If this deadline is exceeded by more than one year, not yet passed examinations of these modules are deemed to have failed for the first time. This does not apply if the student proves that he or she is not responsible for the deadline. The regulation does not apply to the Master thesis.

§ 7
Organization of study

(1) The curriculum includes a compulsory and elective area as well as a project area.

(2) Compulsory modules are all modules that are required by the examination and study regulations for the successful completion of studies.

(3) Compulsory elective modules are all modules that students have to select from the compulsory optional subject area in accordance with the examination and study regulations. The compulsory elective modules make it possible, in the context of the chosen field of study, to pursue individual inclinations and interests or to take into account the subject-specific requirements of students' later field of activity. The elective modules are subdivided into different subject areas. The list of majors and elective modules may be changed according to the development of subjects and the availability of teachers and adapted to the curriculum of the department. At the request of the student to the Examination Board of the Faculty of Electrical Engineering and Information Technology of the Medical Systems Engineering degree program of the Otto von Guericke University Magdeburg, further modules from all faculties of the Otto von Guericke University Magdeburg may be acknowledged as elective subject with the agreement of the course director.

(4) Compulsory and elective modules are completed with module examinations consisting of one examination. Examinations are to be provided course-related during or at the end of the respective module. For each successfully completed module, a certain number of credit points (CP) are awarded according to the European Credit Transfer System (ECTS).

(5) Free elective modules are all modules that students, at their own discretion, take in addition to compulsory and elective modules from modules of Otto-von-Guericke-University Magdeburg. Students can take an exam in the elective modules. The result of this test is not taken into account when determining the overall grade. Upon request, it will be included in the certificate.

(6) An elective compulsory or elective module is conducted if at least 5 students attend.

(7) The degree is completed with a thesis, the master thesis (and its presentation in a defence. The master's thesis and the defence is consistent to an expenditure of altogether 30 CP. The processing time is 20 weeks. The final thesis should show that the students are able to independently and competently work on a scientific problem within a given time.

(8) The dates listed in the Annex for the assignment of modules and the passing of examinations are to be understood as a recommendation for the completion of the studies in the standard period of study, subject to the provision in § 6 (6). Further information about the degree program is available in the academic couseling of the Faculty of Electrical Engineering and Information Technology.

§ 8
Type of courses

(1) The courses are held in the form of lectures, exercises, laboratory internships, projects and seminars.

(2) Lectures serve the coherent presentation and teaching of scientific, functional-technical and creative basic and specialized knowledge as well as methodological knowledge.

(3) Exercises serve above all to deepen the knowledge imparted in the lectures and to acquire methodological skills in connection with practice-oriented practice.

(4) In laboratory internships the mediated knowledge is applied and thus deepened.

(5) In projects, the students work on a complex task with special consideration of theoretical principles and practical examples. The presentation of the result takes place in a project completion thesis with associated colloquium, which is thus customary for later professional activity. It can be supervised by an interdisciplinary teaching team whose members can act as both coach and mentor. The students can come from different courses and semesters. Access to projects can be bound to specific student inputs in addition to the module's provisions.

Students have the opportunity to work on a project independently within one semester, in consultation with a teacher of the program.

(6) Seminars serve as a scientific review of theoretical and practical issues in the interaction of teachers and students. This can be done in changing forms of work (information presentations, papers, theses, discussions) and in groups.

§ 9
Study counseling

(1) In order to make it easier for first-year students to orient themselves at Otto von Guericke University Magdeburg, introductory courses are offered at the beginning of each study program.

(2) These examination and study regulations contain information of a general manner, which is why further information is required for the exact orientation and planning of the study. For this purpose, it is recommended for students to familiarize themselves with the module handbook.

(3) The faculty offers study counseling for each degree program. The corresponding persons are listed on the homepage of the faculty and in the examination office.

(4) A study counseling can be used at any time and is particularly useful in the following cases:

- Start-up difficulties at the beginning of the studies,
- Choice of main focus of studies and specializations,
- substantial exceeding of the standard study period,
- failed exams,
- study course or university change,
- Study abroad and individual curriculum design.

§10
Individual part-time study / individual study plans

(1) There is the possibility of an individual part-time study according to the framework for an individual part-time study at the Otto von Guericke University Magdeburg.

(2) Individual study plans serve for successful completion of studies within the standard period of study. In particular, they are offered to those students who receive special support due to long illness, birth or care of their own children or the like.

(3) Individual study plans are only possible with the approval of the examination board.

(4) The study consultant is the contact person for the students in regard to the preparation of an individual study plan.

III. Examinations

§ 11
Examination board

(1) To fulfill the tasks assigned by these examination and study regulations, an examination board is formed. It usually consists of seven members elected by the faculty council. Of these, five members are appointed, employed or enrolled at the Faculty of Electrical Engineering and Information Technology: The presiding member, the deputy chairman and another member are elected from the group of professors, one member from the group of research assistants and one member from the group of students. Two further members from the group of professors come from the cooperating faculties according to § 1.

(2) The examination board ensures that the examinations are carried out. He ensures that the provisions of these examination regulations are met. He gives suggestions for the reform of these examination and study regulations. Particular importance must be attached to compliance with the standard period of study and examination periods.

(3) The Audit Committee passes its resolutions by a majority of the votes cast. In the case of a tie, the vote of the chairperson shall be the decisive factor, in the absence of him, the vote of the deputy chairperson. The Examination Board has a quorum if the majority of its members, including at least two members from the group of professors, are present.

(4) The term of office of the members of the examination board is two years, that of the student member one year. Re-election is possible.

(5) The Examination Board may revocably assign specific authorities to be determined in the respective individual case, which are regulated in these Study and Examination Regulations and / or the Rules of Procedure of the Examination Committee, to the chairman or the vice-chairperson. The chairperson prepares the resolutions of the Examination Board, executes them and continuously reports to the Audit Committee on his or her activities.

(6) The members of the Examination Board have the right to participate in the acceptance of examinations as observers.

(7) The members of the Audit Committee are subject to official secrecy. Unless they are employed in the public service, they are required by the chairman to maintain secrecy.

(8) To support the work of the examination board, the faculty has an examination office.

§ 12
Examiners and observers

(1) The Examination Board appoints the examiners and the assessors. Professors, junior professors, university lecturers, academic assistants as far as they perform teaching duties, lecturers as well as persons experienced in professional practice and education are authorized to take university examinations. Examinations may only be graded by persons who have at least a Master's degree or equivalent degree.

(2) At least two examiners are to be appointed for the evaluation of written examination achievements, provided that the passing of the examination is a prerequisite for the continuation of the study. If the examination board decides for an exam date that including all the persons authorized to examine according to paragraph 1 the additional burden imposed by an order would be unacceptable or two examiners are absent, or if two examiners are absent, it may decide that the respective written examination achievements are to be evaluated only by one examiner. The decision must be communicated to the students when they register for the exam.

(3) For the evaluation of the Master thesis, two examiners have to be appointed, one of them has to be a professor.

(4) Students can suggest examiners for oral examinations and the master thesis. The proposal does not constitute a legal claim.

(5) The examiners are independent in their examination activity.

(6) The examination board ensures that the names of the examiners are announced in time to the students.

§ 13
Acknowledgment of the years of study, the course achievement and the examination achievements

(1) The examination board will decide on the acknowledgement of study periods, study and examination achievements upon written application. The application for credits for study periods, study and examination achievements, which were made before admission to the study program, must be submitted to the examination board of the corresponding degree course within four weeks of taking up the study program. The students must submit the documents required for the acknowledgement in their original or in certified form. The documents must be submitted in German or English or in a corresponding translation by sworn translators. The acknowledgement of periods of study, study and examination achievements, which were accomplished before the admission of the study, is excluded after the expiration of the application period.

(2) Study periods, study and examination achievements in courses of study at universities are taken into account within the scope of the Basic Law, as far as no essential difference is to be determined. Study periods, study and examination achievements that were rendered abroad are acknowledged, as long as there is no significant difference. When acknowledging study periods, academic achievements and examinations performed outside the Federal Republic of Germany, the Lisbon Convention of 11th November 1997, the equivalence agreements approved by the Conference of the Ministers of Education and the German Rectors' Conference as well as arrangements under university cooperation agreements must be observed.

The burden of proof that an application does not meet the relevant requirements lies with the examination board.

The basis of valuation, if already mutually applied, is the European Credit Transfer System (ECTS).

(3) For comparable grading systems, the grades are taken over and included in the calculation of the overall grade.

(4) Up to 50% of the knowledge and skills acquired outside the university can be recognized in higher education, provided that they are equivalent in content and level to the study modules. The application for recognition must be submitted to the examination board within four weeks after the beginning of the study. Students must submit the documents required for recognition in their original form or in certified form. The recognition of master theses and internship modules is not possible. The recognition of knowledge and skills acquired outside the university is excluded after the application deadline.

§ 14
Types of course-related examinations

(1) The following types of study-related examination achievements are possible:

1. Written examination (written exam)
2. Electronic exam (written exam)
3. Oral examination
4. Scientific project
5. Seminar work / housework
6. Report
7. Experimental work

(2) In a written exam, the students should demonstrate that they can identify a problem in limited time with limited tools and under supervision with the usual methods of the subject area and find ways to a solution. The processing time of an exam is at least 60, but not more than 240 minutes. Written and electronic exams can be done in the answer-choice-procedure (multiple choice exam).

(3) Oral examinations should prove to the student that he or she recognizes the interrelations of the examination area and is able to classify special questions in these contexts. In the course of the oral examination, a reasonable amount of written work may also be required if it does not invalidate the oral nature of the examination.

The oral examination takes place in front of several examiners (collegial examination) or in front of an examiner and an expert assessor as a single or group examination, whereby up to 3 students can form a group. The assessor is to be heard before the grading. The duration of the exam is usually at least 15 minutes for each student, but not more than 45 minutes. The main subjects of the examination and the assessment of the examination must be recorded in a protocol. It is to be signed by the examiners and the assessors. The result of the examination is to be announced to the student after the oral examination.

(4) By participating in a scientific project students should prove that they are capable of independent scientific work and teamwork. The independent share of project processing must be proven.

(5) A term paper / homework requires an experimental, empirical or theoretical processing of a task from the area of expertise. The task is to be arranged so that it can be processed within the set time limit. The students can submit suggestions for the topic and the task. These do not constitute a legal claim. In appropriate cases, the solutions developed may be explained orally in a typical manner of the profession. If there is an above-average burden on students with other examinations, the processing time can be extended by up to 50% on request. It is important to ensure compliance with the standard period of study.

(6) A presentation includes:

- an independent and in-depth written examination of a problem arising from the work context of the course, including and evaluating relevant literature as well as
- the presentation of the work and the presentation of its results in the oral presentation as well as in the subsequent discussion. The elaborations must be in writing.

(7) An experimental work includes in particular:

- the theoretical preparation of experiments,
- the construction and execution of experiments,
- the written presentation of the work steps, the experimental procedure and the results of the experiments as well as their critical appraisal.

(8) As prerequisite for the admission to a course-accompanying examination achievement of the modules examination pre-performances (proof of achievement) can be demanded. Failed exams can be repeated. The conditions for the acquisition of examinations prerequisite as well as their type and extent are to be announced by the lecturers at the beginning of the event.

(9) Examination achievements can also be admitted in the form of joint work. The contribution of the individual(s) must meet the requirements of the examination and be clearly distinguishable and assessable as an individual performance based on the indication of sections and page numbers or other objective criteria.

(10) The type and scope of examinations for the individual modules can be found in the examination plan or the module manual. The forms of examination in this order (written or oral) may be amended providing the following conditions:

- If 12 or less candidates are enrolled or expected for the written exam, the examination board may, at the request of the examiner, authorize oral exams to be taken instead. This approval is valid for one exam date each.
- If more than 20 candidates are enrolled or expected to attend a scheduled oral examination at one examination date, the examination board may, at the request of the examiner, authorize the examination to be held in the form of a written exam instead. This approval is valid for one exam date each.

An amendment of the form of examination approved by the examination board must be notified to the affected students without delay.

(11) The examiner decides on aids that may be used in an exam. A list of approved aids must be announced at the same time as the announcement of the exam date. The criteria of the examination evaluation should be disclosed. The grades are usually announced after 4 to 6 weeks at the latest.

(12) For module examinations of other faculties, the regulations of the corresponding faculties apply.

§ 15
Protective provisions, compensation for disadvantages

(1) If students demonstrate through a medical certificate or presentation of a disability card that they are unable to pass the examination in full or in part in the prescribed form due to a long-term or permanent illness or disability, the examination board may give them the opportunity to be able to provide equivalent examinations in another form, as far as this is necessary for the establishment of equal opportunities.

For this purpose, processing periods may be extended to an appropriate extent or the completion of the examination may be approved in another form. The compensation for disadvantages must be requested in writing from the examination board. The application should be submitted with the request for examination the latest.

(2) The protective provisions according to the Maternity Protection Act and the deadlines of the Federal Education Allowance Act on parental leave are to be considered appropriately in the application of these examination regulations, especially in the calculation of time limits, and to enable their use. Students who have been on leave for family responsibilities can volunteer their studies and examinations during their absence. On written application addressed to the examination board it is possible to repeat a failed examination during the leave period.

§ 16
Publicity of oral examinations

Students who have not successfully completed the respective examination can be admitted as listeners in oral examinations, provided that they are not registered for this examination. This does not extend to the consultation and announcement of the examination result to the students. At the request of a student to be examined, the listeners according to sentence 1 are to be excluded.

§ 17
Acceptance of course-related examination achievements

(1) Students who are enrolled in Otto von Guericke University's course of study listed in §1 may be admitted to the course-related examinations.

(2) Students in this program apply for admission to the course-related examination and retake examinations within the time period specified by the examination board and in the form specified. Failure to comply with the registration deadline excludes admission to the examination, unless the examination board decides otherwise upon written request of the student.

(3) The application for admission must be accompanied, if necessary, by examiner proposals and proof of the examinations that have been completed, unless such documents are available from Otto von Guericke University.

(4) The application can be revoked no later than one week before the respective examination date. In the case of resignation, the admission in accordance with paragraphs 1 and 2 shall be requested again at a later examination date.

(5) The examination board decides on admission. It has to be denied if:

- the admission requirements are not fulfilled or
- the documents are incomplete or
- the examination performance was finally "failed" or finally considered as "failed".

§ 18
Assessment of the examination achievements and generation of the module mark

(1) The individual examination performance is evaluated by the respective examiners. For written examinations, the assessment should be announced not later than 4 to 6 weeks after the respective examination.

(2) The following grades are to be used for the evaluation of performances:

Note		
1	very good	an excellent performance
2	good	a performance that is significantly above average requirements
3	satisfactory	a performance that meets average requirements
4	fair/pass	a service that, despite its defits, still meets the requirements
5	fail	a service that no longer meets the requirements due to significant deficiencies

For a differentiated assessment of the examination achievements, individual grades can be raised or lowered by 0.3 to intermediate values; the grades 0.7; 4.3; 4.7 and 5.3 are excluded.

(3) An examination is passed if it has been rated at least "fair/pass". If the examination is graded by several examiners, it is passed if all the assessments are at least "fair/pass". In this case, the grade of the examination is the arithmetic mean of the individual grades set by the examiners, which is truncated to one decimal place; contrary to the definition in paragraph 2.

(4) A module examination is passed if the required examination performance has been rated at least "fail/pass". If a module examination consists of several examinations, the module grade is the weighted arithmetic mean of the grades of examinations in the module, which is truncated to one decimal place after the decimal point; contrary to the definition in paragraph 2.

(5) A multiple choice exam is passed if the candidate has achieved at least 50 percent of the possible score (absolute pass rate) or if the candidate's score does not go below the average exam by more than 22 percent of the candidate's performance of the respective examination date (index clause). The index clause only applies if the candidate has achieved at least 40 percent of the possible score. For the determination of the individual examination results, the difference between the relative and absolute pass mark is added to each candidate for the examination. This paragraph applies, provided that the proportion of examination questions in the answer-election-procedure exceeds 50%.

(6) When a score is averaged, only the first decimal place after the decimal point is taken into account; all other digits are deleted without rounding. The predicate is:

At an average grade	**predicate**
up to and including 1.5	Very good
from 1.6 to 2.5 inclusively	good
from 2.6 to 3.5 inclusively	satisfactory
from 3.6 to 4.0 inclusively	fair/pass
from 4.1	fail

§ 19
Repetition of course-related examination achievements

(1) There is a possibility of repetition for exams that have failed or are considered as failed. A second repetition is possible for three exams.

(2) A second repetition of a course-related examination is to be requested by the student in writing within a preclusive period of 6 weeks after the notification that the first repetition of the course-related examination has failed.

(3) Re-examinations are to be taken after 6 weeks at the earliest and 14 months after failure of the exam at the latest, unless the student has been granted a grace period due to special reasons beyond his control. This requires an announcement again. For the evaluation § 18 applies accordingly. In the case of interruption of studies and in other justified cases, binding agreements must be made regarding the passing of re-examinations by the examination board. If the repetition period is missed, the examination is considered as failed.

(4) In the chosen course of study at a university within the scope of the Basic Law unsuccessful attempts to take an examination performance are to be counted towards the repetition possibilities.

(5) A passed exam cannot be repeated.

§ 20
Additional exams

(1) Students can also take examinations in compulsory and elective modules that are specified in the attached Examination Schedule.

(2) The result of the additional examinations will be included in the certificate or attestation at the request of the student. In the calculation of the average grades and the determination of the overall grade, the results of additional examinations are not included.

IV. Master's degree

§ 21
Registration for the Master's thesis

(1) Only those who are enrolled at the Otto-von-Guericke-Universität in the degree program listed in § 1 and who can demonstrate at least 75 CP from compulsory and elective courses are admitted for the Master's thesis.

(2) Students apply for admission to the Master's thesis in writing to the Examination Board. The proposal for the Master's thesis is accompanied by a proposal for the subject area, to which the topic of the Master's thesis is to be taken, and, if applicable, an application for the assignment of the topic as a joint work and, if appropriate, to the suggestion of the examiner.

(3) The date of issue of the topic is to be recorded at the examination office of the faculty.

(4) Resignation from the Master thesis thesis is possible before the beginning of the processing time. In the case of withdrawal, the admission must be re-applied at a later date.

§ 22
Release of the topic, submission and evaluation of the master thesis

(1) The master thesis should show that the students are able to independently work on a problem with scientific methods within a given deadline. The topic and the task of the master thesis must correspond to the examination purpose and the processing time.

(2) Generally, the topic of the Master's thesis is issued 4 weeks after the admission to the Master's thesis at the latest. The students should be given the opportunity to make suggestions for the topic and the task of the master thesis. The proposal of the student should be met as far as possible. It does not establish a legal claim. The chairperson of the examination board ensures that the student receives a topic for a master thesis within a reasonable period of time. With the issue of the topic, the first examiner who has determined the topic and the second examiner are appointed.

(3) The Master's thesis is issued and supervised by an authorized person appointed in accordance with § 12 (1). This person must be a member of the faculty to which the degree program belongs. The task is to be confirmed by a professor. If several faculties are involved in a degree program, that person must belong to one of these faculties. The subject matter may, in exceptional cases, be issued by a qualified examiner with the approval of the examination board, which does not fulfill this condition. In this case, the second person to be assessed should be a faculty member. In justified exceptional cases, with the approval of the examination board, the second examiner may also be a professor who is not a member of this faculty.

(4) The date of issue of the topic is to be recorded at the examination office of the faculty.

(5) The master thesis can be done in the form of a teamwork. The individual contribution to be assessed as an examination must be clearly identifiable and self-assessable on the basis of sections and page numbers or other objective criteria and be in accordance with the requirements of paragraph 1. The group is limited to up to three students.

(6) The time from the issue of the topic to the submission of the master thesis is 20 weeks. For demonstrable reasons for which the student is not responsible, the processing time may be extended on written request to the examination board. An attempt to quit because of a too long disease is not to be counted against the possibility of repetition. The topic can only be returned once and only within the first third of the processing time.

(7) A reasoned application for a renewal of the deadline for a maximum of 6 weeks is to be submitted by the student to the Examinations Board in due time after having received the opinion of the supervising person.

(8) When submitting the Master's thesis, students must assure in writing that they independently wrote the work - in the case of a joint project - the correspondingly marked portion of the work - and that they did not use sources other than the indicated ones.

(9) The Master thesis has to be submitted in time in duplicate in accordance with the design guideline for the preparation of bachelor and master theses of the Faculty of Electrical Engineering and Information Technology at the examinations office, the submission deadline is to be recorded. If the thesis is not submitted on time, it is considered as "fail".

(10) The thesis should be reviewed and evaluated by the examiners within four weeks after submission. § 17 applies accordingly. The module grade is made up to 2/3 from the grade of the master thesis and 1/3 from the grade for the defense. The master thesis is not passed if one of the two grades is "fail". For the successfully passed master thesis with the defense 30 CP will be awarded.

(11) The master thesis is to be written in German or English.

§ 23
Defense

(1) In defense, students have to prove that they are able to defend the work results of the scientific work on a subject in a technical discussion.

(2) Conditions for the admission to the defense are the passing of the module examinations and that the master thesis was evaluated by both examiners with at least "fair/pass".

(3) The defense is conducted as a single or group examination by the examiners of the Master's thesis. The examination board may appoint additional examiners. In defense, the topic of the Master's thesis and the associated problems and results should be presented in a maximum of 20 minutes (lecture) and subsequently questions related to this topic should be answered. In a group exam, the time is reduced to a maximum of 15 minutes per student. The total duration of defense for each student is usually 60 minutes, but not more than 90 minutes.

(4) The defense is passed if it has been rated at least "fair/pass" by the examiners.

§ 24
Repetition of the thesis and master thesis defence

(1) The Master's thesis can be repeated once with a new topic if it has been graded "fail" or is classified as "fail".

(2) However, a return of the topic in case of a repetition of the Master's thesis is only permitted if this option has not already been used during the first work.

(3) The new topic of the Master Thesis will be issued within a reasonable time, usually within three months.

(4) The repetition of a passed master thesis is excluded.

(5) The defense of the Master's thesis can be repeated once if it is rated as "fail" or is classified as "fail". The repetition must be carried out within 4 weeks.

(6) The repetition of a successful defense of the repeated Master's thesis is excluded.

§ 25
Overall result of the Master's degree

(1) The Master's examination is passed if all course-related examinations of the compulsory and elective modules required by the curriculum and the Master's thesis with the defense have been assessed as at least "fair/pass".

(2) The overall grade of the degree is formed by

- 3/4 from the CP-weighted grades of the module exams
- 1/4 from the grade of the master thesis with the defense.

For the calculation of the overall grade, two decimal places are used for the partial values, for the overall grade only the first decimal place after the decimal point is taken into account. The remaining decimal places are cut off.

(3) If the average of the final grade is better than 1.3, the grade "passed with distinction" is awarded.

(4) The Master's degree is definitely not passed if a course-related examination or the Master's thesis with the defense was rated as "fail" or is classified as "fail" and a repetition is no longer possible.

§ 26
Certificates and statements

(1) A certificate must be issued immediately, if possible within four weeks, of the passed Master's examination. The certificate has the date of the day on which the last examination was performed. It must be signed by the chairman of the responsible examination board and provided with the seal of Otto-von-Guericke-University.

(2) If a candidate has achieved the master's degree, he will receive a certificate of the results. The certificate will include the grades of the modules, the grade of the Master's thesis and the overall grade and ECTS grade. Furthermore, the certificate includes the topic of the Master's thesis as well as - at the request of the candidate - the result of the examinations of additional subjects.

(3) With the certificate the students receive a Diploma Supplement.

(4) If the Master's degree is not passed or if it is considered as failed, the examination board will issue a written notification to the student, which also provides information on whether and, if so, to what extent examination results can be repeated.

(5) If students leave the university or change their course of study, they will be issued upon request with a certificate containing the examination results and their evaluation. It shows the missing examination achievements as well as whether the master's examination is failed or was definitely not passed.

§ 27
Document

(1) With the certificate the students receive the certificate with the date of the certificate. It certifies the award of the master's degree.

(2) The certificate will be signed by the dean of the Faculty of Electrical Engineering and Information Technology and the chairman of the responsible examination board, as well as added with the seal of Otto-von-Guericke-University.

V. Final provisions

§ 28
Inspection of examination records

Students are granted access to the study and examination file three months after completing their studies upon written application. The application must be submitted to the examination board of the Faculty of Electrical Engineering and Information Technology. The chairperson of the examination board determines the place and time of the inspection.

§ 29
Failure, withdrawal, deception, breach of regulations

(1) A course-related examination is considered as "fail" if the student has no valid reason:

- to not appear at an exam date binding for him or her,
- to withdraw from the exam after the beginning of an exam,
- to not perform the examination or its repetition within the specified deadline.

(2) The reasons for withdrawal or default are to be reported in writing to the examination board without delay and made credible. If this is not the case, the examination performance is graded as "fail". In case of illness, a medical certificate is required. If the reasons are recognized, the examination performance is to be performed at the next regular examination date, unless the examination board decides otherwise.

(3) If the student attempts to influence the result of an examination by deceit or by using unauthorized aids, the respective examination performance is deemed to be "fail". Anyone who disturbs the orderly course of the examination can be excluded from the continuation of the examination by the examiner or supervisor. In this case, the examination performance is graded as "fail". In serious cases, the examination board may exclude the student from providing further examinations.

(4) If, in the case of an examination, the deadline is not met for reasons attributable to the student (s) to be examined, then it is deemed to have been graded "fail". Paragraph 2 applies accordingly..

§ 30
Invalidity of the examination achievements

(1) If a student or a student has cheated during an examination and this fact becomes known only after the certificate has been handed over, the examination board may declare the examination completely or partially failed.

(2) If the requirements for admission to an examination were not met, and no deception was intended, and if the fact becomes known only after the certificate has been handed over, this deficiency will be remedied by passing the examination. If students have intentionally obtained the admission unjustly, the examination board will decide on the withdrawal of illegal administrative acts in compliance with the legal provisions.

(3) The students concerned should be given the opportunity to discuss the matter with the examination board before making a decision.

(4) The incorrect certificate must be withdrawn and, if necessary, replaced by a new certificate or a certificate pursuant to § 26 (5). The Master's certificate is to be withdrawn if the Master's examination has been declared "failed" due to the act of deception. A decision under paragraph 1 and paragraph 2 shall be excluded after a period of five years from the date of the certificate.

§ 31
Decisions, opposition proceedings

(1) All decisions that are made in accordance with these examination regulations and constitute, an administrative act must be substantiated in writing, provided with a legal remedy and announced in accordance with § 41 VwVfG LSA. A protest may be lodged against this decision within one month of notification. The objection must be submitted to the examination board of the Faculty of Electrical Engineering and Information Technology in writing or for record.

(2) The examination board decides on the objection. Insofar as the opposition is directed against an assessment, the examination board shall forward the objection to the examiner concerned for review. If the evaluation is changed as requested, the examination board will help to resolve the objection. Otherwise, the selection board will only check the decision on whether

1. the examination procedure has been carried out properly,
2. the examiner acted on the assumption of an incorrect fact,
3. General valuation principles have been observed,
4. the examiner was guided by extraneous considerations.

§ 32
Withdrawal / Revocation of the academic title

The withdrawal or revocation of the Master's degree takes place in accordance with the Higher Education Act Saxony-Anhalt.

§ 33
University public announcements of the examination board

Decisions and other measures to be taken in accordance with these examination regulations, in particular the admission to the examination, the refusal of the admission, the registration and examination dates and deadlines as well as the examination results, will be published in the public domain in the usual way. In doing so, data protection regulations must be observed.

§ 34
Temporary arrangement

This regulation is valid for all students enrolled in the degree program Medical Systems Engineering starting in the summer semester 2018. Students who have already enrolled in the Medical Systems Engineering degree course before 01.04.2018 can apply to join these regulations. The application must be submitted in writing to the examination office of the Faculty of Electrical Engineering and Information Technology. It is irrevocable.

§ 35
Coming into effect

These Study and Examination Regulations come into effect on the day after their publication in the Official Announcements of the Otto von Guericke University.

Issued on the basis of the resolutions of the Faculty Council of the Faculty of Electrical Engineering and Information Technology of 10.01.2018 and the Senate of the Otto von Guericke University of 31.01.2018.

Magdeburg, 06.02.2018

sgd. Prof. Dr.-Ing. Jens Strackeljan

Rektor
of Otto-von-Guericke-University Magdeburg

General curriculum

Master program

Medical Systems Engineering

Explanation to the general curriculum:

S = semester hours (SWS)
A = Types of courses
- **V** = Lecture
- **S** = Seminar
- **Ü** = Tutorial
- **K** = Colloquium
- **LP** = Lab Project
- **PRO** = Research Project
- **E** = Field trip
- ***** = Depends on the chosen modules or not applicable

CP = Credit Points

Legende zum Regelstudienplan:

S = Semesterwochenstunden (SWS)
A = Art der Lehrveranstaltung
- **V** = Vorlesung
- **S** = Seminar
- **Ü** = Übung
- **K** = Kolloquium
- **LP** = Laborpraktikum
- **PRO** = Wissenschaftliches Projekt
- **E** = Exkursion
- ***** = Abhängig von der Modulwahl oder nicht zutreffend

CP = Credit Points = Leistungspunkte

General scheme

General scheme of the curriculum. The distribution of credit points within one depends on the chosen modules. The total workload is constant.

	1. Semester			2. Semester			3. Semester			4. Semester			Total		
	CP	S	A	CP	S	A	CP	S	A	CP	S	A	CP	S	A
Technical compulsory modules	24			11									35		
Methodical and social compulsory modules	5			5									10		
Elective modules - Deepening 1				5			10						15		
Elective modules - Deepening 2				5			10						15		
Elective modules - Deepening 3				5			10						15		
Master Thesis										30			30		
	29 CP			31 CP			30 CP			30 CP			120 CP		

Further information about the compulsory modules can be found in the following charts. Further information about the elective modules in the "Catalog of Elective Modules". For detailed information of all modules, see the document "Module descriptions".

Technical compulsory modules

Enrolment: All modules.

	1. Semester			2. Semester			3. Semester			4. Semester			Total		
	CP	S	A	CP	S	A	CP	S	A	CP	S	A	CP	S	A
Anatomy for Engineering students	4	3	S										4	3	S
Biological Statistics	5	4	V/Ü										5	4	V/Ü
Medical Imaging and Diagnostics	5		V/S/Ü										5		V/S/Ü
submodule: Introduction into Medical Imaging		*3*	*V/Ü*											*3*	*V/Ü*
submodule: Radiological Diagnostics		*1*	*S*											*1*	*S*
Medical Measurement Technology	5	4	V/S										5	4	V/S
Medical Physics and Radiation Protection	5	3	V										5	3	V
Mathematical foundations				6	4	V/Ü							6	4	V/Ü
Digital Information Processing				5	3	V/Ü							5	3	V/Ü
	24 CP			**11 CP**									**35 CP**		

Methodical and social compulsory modules

Enrolment: All modules.

	1. Semester			2. Semester			3. Semester			4. Semester			Total		
	CP	S	A	CP	S	A	CP	S	A	CP	S	A	CP	S	A
Scientific working	5	4	S										5	4	S
Solution Design in Medical Engineering				5	3	S							5	3	S
	5 CP			**5 CP**									**10 CP**		

Master Thesis

	1. Semester			2. Semester			3. Semester			4. Semester			Total		
	CP	S	A	CP	S	A	CP	S	A	CP	S	A	CP	S	A
Master Thesis										30			30		
										30 CP			30 CP		

Examination schedule

Master program

Medical Systems Engineering

Explanation to the Examination schedule:

LN = Required course certificates (prerequisite)
- * = Depends on the chosen modules

PL = Types of course-related examination achievements
- **K** = written examination
- **M** = oral examination
- **SA** = seminar paper
- **HA** = thesis
- **EA** = experimental work
- **PRO** = research project
- **R** = seminar paper
- * = Depends on the chosen modules

CP = Credit Points

Timing of the course assessment:

During the examination period of the semester in which the course attended.

Legende zum Prüfungsplan:

LN = erforderliche Leistungsnachweise (Prüfungsvorleistung)
- * = Abhängig von der Modulwahl

PL = Art der Prüfungsleistung
- **K** = Klausur
- **M** = Mündliche Prüfung
- **SA** = Seminararbeit
- **HA** = Hausarbeit
- **EA** = Experimentelle Arbeit
- **PRO** = Wissenschaftliches Projekt
- **R** = Referat
- * = Abhängig von der Modulwahl

CP = Credit Points = Leistungspunkte

Zeitpunkt der Prüfungsleistung:

Im Prüfungszeitraum am Ende des Semesters, in dem das Modul belegt wurde.

General scheme

	LN	PL	CP
Technical compulsory modules	-----	-----	35
Methodical and social compulsory modules	-----	-----	10
Elective modules - Deepening 1	-----	-----	15
Elective modules - Deepening 2	-----	-----	15
Elective modules - Deepening 3	-----	-----	15
Master Thesis	-----	-----	30

Technical compulsory modules

	LN	PL	CP
Anatomy for Engineering students	Seminar certificate	R	4
Biological Statistics	-----	K120	5
Medical Imaging and Diagnostics	-----	K90	5
submodule: Introduction into Medical Imaging	-----	-----	-----
submodule: Radiological Diagnostics	Seminar certificate	-----	-----
Medical Measurement Technology	Seminar certificate	M	5
Medical Physics and Radiation Protection	-----	K90	5
Mathematical foundations	-----	K90	6
Digital Information Processing	Tutorial certificate	K120	5

Methodical and social compulsory modules

	LN	PL	CP
Scientific working	-----	R	5
Solution Design in Medical Engineering	Seminar certificate	R	5

Master Thesis

	LN	PL	CP
Master Thesis	-----	R	30