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Information on the courses of study “Master of Science in Data and Knowledge Engineering and Digital Engineering” for English-speaking students

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Regulations for degree programmes “Master of Science in Data and Knowledge Engineering and Digital Engineering” – Otto von Guericke University Magdeburg

On the basis of the Universities Act of the state of Saxony-Anhalt dated 14/12/2010, Otto von Guericke University Magdeburg has enacted the following statutes:

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I. General

§ 1 Scope of application

(1) These Study and Examination Regulations govern the objective, content and structure, together with the examinations and the certification of the Master's degree in Data and Knowledge Engineering and Digital Engineering in the Faculty of Computer Science at Otto von Guericke University Magdeburg.

(2) These Master's degree courses are full-time, classroom-based study courses whose profile type is categorized as "more research-oriented".

(3) It is possible for students to undertake an individualized part-time course of study in accordance with the framework regulations for individualized part-time courses of study at Otto von Guericke University Magdeburg.

§ 2 Programme objective

The objective of the programme is for students to acquire a broad but simultaneously detailed and critical understanding of the subject as well as the ability to work independently in accordance with scientific methods, to familiarize themselves independently with fields of activity relating to practice, research and teaching and to deal with the frequently changing array of tasks in the working life.

The Master's degree course supplements the content of the preceding Bachelor's degree course and, in terms of quality, considerably exceeds it. Students will acquire skills to enable them to critically examine opinions in their subject area, to solve problems as they arise in a scientifically structured way taking into account neighbouring disciplines, and to represent their solution / communicate their knowledge to their peers as well as lay persons. They will be in a position to creatively develop their subject area beyond the current level and to acquire new knowledge. Graduates will be able to reach scientifically founded decisions, even on the basis of limited information, and to take societal and ethical insights into account in the process. They will be able to take on responsibility within a team.

Course-specific objectives will be outlined in the appendix.

§ 3 Academic title

Once the examinations required to graduate have been successfully completed, Otto von Guericke University shall award the academic title of

"Master of Science", or: "M.Sc." for short.

II. Scope and Progression of Course

§ 4 Admission to the course / admission requirements

(1) The conditions for admission to the Master's degree course are as follows:

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- a) The applicant must provide proof of holding a Bachelor's degree, a university diploma or a comparable degree awarded by a state or state-recognized college of advanced vocational studies, a Magister degree or must have passed a state examination in a closely related subject.
- b) The completed degree must equate to
- DKE: at least 60 ECTS in Computer Science and Applied Statistics, whereof at least 40 ECTS must be in Computer Science. The ECTS must not be acquired during internships
 - DigiEng: in Computer Science or in a field close to Computer Science or in an Engineering Science.
- c) Further admission requirements are that the first professional training stated in para. 1 was finished with good or very good results in a related field and that the standard period of study was at least 6 semesters or that at least 180 CP were acquired. The Board of Examiners decides about admission from a related field (see para. 1).
- d) Specific suitability in accordance with paragraphs 2 to 4 must be demonstrated. The Board of Examiners is responsible for exception decisions.
- (2) The candidate's specific suitability will be determined on the basis of the results of the degree examination in accordance with para. (1)a and requires the previous course of studies to have been completed with an overall grade of at least "good".
- (3) Notwithstanding paragraph 2, specific suitability shall be assumed if the degree has not yet been completed at the time of submitting the application, but evidence is available of the candidate having already obtained at least 150 credit points (CP) on a six-semester Bachelor's degree course or 180 CP on a seven-semester Bachelor's degree course, and the average grade calculated from the examinations already completed is at least 2.5.
- (4) Admission must be refused if the applicant has irrevocably failed examinations in the chosen course of study at a university or equivalent institute of higher education that falls within the area of application of the German Basic Law or is currently engaged in a corresponding examination procedure.
- (5) Over and above this, applicants must have adequate knowledge of the English or German language at the level of university entrance qualification. Foreign applicants must either have passed DSH level 2 or TestDaF with 4/4/4/4 or TOEFL (with the following minimum scores: paper-based 527 or computer-based 197 or internet-based 71) or IELTS (total score: at least 6.0) or submit the CAE (Cambridge Certificate in Advanced English) with at least "B" or the CPE (Certificate of Proficiency in English) with at least "C". Special provisions may be defined.
- (6) The decision regarding whether or not the admission requirements are satisfied shall be made by the Board of Examiners.
- (7) The certificates and proofs must be submitted in German or English or must be translated by a sworn translator.

§ 5 Commencement and duration of studies

- (1) Enrolment is possible in the summer and winter semesters.

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(2) The standard course duration, including the preparation of the Master's thesis is 4 semesters.

(3) The Master's degree course is designed in such a way that the course, including the preparation of the Master's thesis and colloquium, can be completed in a standard duration of 4 semesters.

§ 6 Organisation and scope of studies

(1) The required study effort is indicated by the number of credit points (CP) according to the European Credit Transfer System (ECTS). Altogether this amounts to 120 CP, which are divided into mandatory modules and the Master's thesis. The completion of additional free elective modules is also possible. For the successful completion of the Master's degree course, a total of at least 300 CP must be obtained, inclusive of the undergraduate course of studies.

(2) The credit points specified describe the study effort, which is comprised of the participation in classes, the preparation for and reviewing of classes, independently processing and consolidating the subject matter and demonstrating study achievements. One credit point corresponds to an effort of approx. 30 working hours. The workload is approx. 30 CP per semester.

(3) Usually, the degree course is divided into three phases:

- one semester, which imparts necessary basic knowledge for the course of study,
- two semesters to reach the required credit points from the offered courses,
- one semester for writing the Master's thesis.

See appended study and examination schedules.

(4) The content of the course can be found in the module handbook.

§ 7 Course structure

(1) The teaching programme includes mandatory and mandatory elective modules.

(2) The designation "mandatory modules" applies to all modules that are required for successful completion of the course of studies in accordance with the Examination and Study Regulations. The amount of work for the mandatory modules is stated in the study and examination schedules in the appendix.

(3) Mandatory elective modules are all modules that are offered in the mandatory courses as well as in the field of key and method skills of the individual Master programmes and which are mandatory for the successful completion of the course of studies.

(4) Within the context of the chosen discipline, the mandatory elective modules enable students to pursue individual inclinations and interests and to take the subject-specific requirements of their future field of professional activity into account. The list of mandatory elective modules may be amended in accordance with developments in the disciplines taught and the availability of teaching staff and be adapted to the teaching programme of the department.

Upon application by the student to the Board of Examiners for the course in the Faculty of Computer Science at Otto von Guericke University Magdeburg, in agreement with the course

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leader/subject advisor, further modules from every faculty at Otto von Guericke University Magdeburg may be recognised as mandatory elective subjects.

(5) The modules are completed with module assessments consisting of one or more examinations. Examinations must be completed during the course of studies either during or at the end of the respective module. For each successfully completed module, a certain number of credits will be awarded in accordance with the European Credit Transfer System (ECTS).

(6) All modules that students complete at their own option in addition to the mandatory and mandatory elective modules from modules offered by Otto von Guericke University Magdeburg are described as free elective modules. Students are free to take examinations in the elective modules. The results of such examinations will not be taken into consideration when determining their final degree classification. However, they will be shown in the transcript on request.

(7) The degree course concludes with a final thesis, known as the Master's thesis, and its presentation in a colloquium. Together, the Master's thesis and colloquium equate to 30 CP. The maximum time that may be taken to complete the thesis is 22 weeks.

(8) The dates mentioned in the appendix for the completion of modules and examinations should be seen as a recommendation for the completion of the degree course within the standard course duration. Further information on the course can be obtained from the examination office of the Faculty of Computer Science, from the subject's student advisory service and from the enrolment office of Otto von Guericke University Magdeburg.

§ 8 Types of teaching unit

(1) Teaching is delivered in the form of lectures, seminars, tutorials, excursions, projects and colloquia (also in combination).

(2) The purpose of lectures is to present and communicate cohesive scientific, functional, technical and creative basic and specialist knowledge as well as methodological skills.

(3) The purpose of seminars is to consolidate the knowledge conveyed in the lectures and to acquire methodological skills in combination with application-oriented practice. This can be realized in changing forms of work (presentation of information, oral presentations, position papers, discussions) and in groups.

(4) Tutorials mainly serve for the deepening of knowledge gained during the lectures and the acquisition of methodical skills combined with application-oriented exercises.

(5) Excursions serve for the demonstration and collection of information and for the practical experience on site.

(6) Projects are used to work on complex tasks taking theoretical principles into particular account on the basis of practical examples. The results are presented in a final project assignment and a colloquium – a method of presentation that is also customary in professional practice. The project may be supervised by an interdisciplinary team of lecturers, members of which may act as both coach and mentor. The students may come from different courses and semesters. Access to projects may depend on the students having fulfilled certain requirements, as well as on the module regulations. It is also possible for students, in agreement with a course lecturer, to work on a project independently during a semester.

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(7) The main focus of the colloquium is to present and defend the knowledge acquired during the project. The objective of the colloquium is to reflect on a subject in theoretical and practical terms to a high professional standard.

§ 9 Departmental academic counselling

(1) In order to facilitate orientation at Otto von Guericke University for new students, introductory courses are held at the start of each programme.

(2) These Examination and Study Regulations only contain information of a general nature; for this reason, further information is needed for precise orientation and planning of the course of studies. To this end, students are also recommended to familiarise themselves with the module handbook.

(3) Academic counselling is offered by the faculty for each course. The relevant persons are listed on the faculty website and in the examination office.

(4) Academic counselling can be called upon at any time and is especially useful in the following cases:

- initial difficulties upon commencement of studies,
- choice of areas of concentration / elective subjects,
- failure to comply with the standard course duration to a significant extent,
- significant shortfall of credit points required per semester,
- failed examinations,
- change of course or university,
- studies abroad and individual study plan organisation.

§10 Individualised study plans

(1) The aim of individualised study plans is to facilitate the successful completion of the course within the standard course duration. They are offered particularly for those students who are dealing with especially heavy demands as a result of long-term illness, the birth of or care for their own children, or similar.

(2) The student advisor is the point of contact for students who wish to draw up an individualised study plan.

III. Examinations

§ 11 Board of Examiners

(1) A Board of Examiners is established to ensure that the duties and responsibilities detailed in these Examination and Study Regulations are satisfied. It consists of 7 members, who are elected by the Faculty Council. The chairperson, deputy chairperson and two further members are elected from among the professors, two members from the academic staff and one member from the student body.

(2) At the beginning of each semester the Board of Examiners determines the period for examinations.

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(3) The Board of Examiners ensures proper implementation of the examinations. Further, the board enforces compliance with the terms set out in these Examination Regulations. It makes suggestions regarding the reform of these Examination and Study Regulations. Special emphasis is placed on compliance with the standard course duration and with examination deadlines.

(4) The Board of Examiners makes its decisions based on a majority vote. In the case of an even split, the chairperson or, when absent, his or her deputy, shall have the casting vote. The Board of Examiners is quorate when the majority of its members, including at least two members from among the professors, are present.

(5) The term of office of the members of the Board of Examiners is two years, with student incumbency limited to one year. Members may be re-elected.

(6) In individual cases, the Board of Examiners may delegate strictly defined and revocable power of authority to the chairperson or his or her deputy. The chairperson prepares and executes the resolutions of the board, and regularly informs board members as to his or her activities.

(7) The members of the Board of Examiners have the right to participate as observers during the examinations.

(8) The members of the Board of Examiners are obliged to maintain confidentiality. If they are not government employees, members must make a pledge of secrecy to the chairperson.

(9) To support the work of the Board of Examiners, there is an examination office in the faculty.

§ 12 Examiners and assessors

(1) The Board of Examiners appoints the examiners and assessors. Professors, junior professors, university lecturers, academic staff, provided that they have a teaching role, teaching staff and persons with experience in professional practice and training are authorised to conduct examinations. Examinations may only be assessed by persons who themselves possess at least a Master's degree or equivalent qualification.

(2) For the evaluation of written examination scripts, at least two examiners must be appointed. If the Board of Examiners determines that, having considered all those authorised to be examiners or assessors pursuant to paragraph 1, the additional burdens arising from appointment as an examiner for a particular examination date would have an unreasonable impact on their other duties, or if two examiners are not available, it can thereupon resolve that the written examinations may be graded by one examiner only. The resolution must be communicated to the students when registering for the examination.

(3) Two examiners must be appointed to evaluate the Master's thesis, of which one must be a university lecturer.

(4) Students may propose examiners for oral examinations and the Master's thesis. This proposal shall not, however, be legally binding.

(5) The examiners are independent in their duties.

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(6) The Board of Examiners is to ensure that students are informed in due time as to the names of the examiners.

(7) For the examiners and assessors, §11 para. 8 applies accordingly.

§ 13 Recognition of periods of study, academic achievements and examination results

(1) Upon written application, the Board of Examiners will decide on the recognition of prior periods of study, academic achievements and examination results. The application is to be addressed to the Board of Examiners of the respective course of study within eight weeks after start of the course. Upon termination of the application period the recognition of these achievements is excluded. For purposes of recognition, students must present the necessary original documents or certified copies thereof.

(2) Periods of study, academic achievements and examination results from courses at universities within the scope of application of the German Basic Law shall be credited, provided that no significant difference can be ascertained. Periods of study, academic achievements and examination results obtained abroad shall be credited, provided that there is no significant difference. When crediting periods of study, academic achievements and examination results obtained outside the Federal Republic of Germany, the Lisbon Convention of 11 November 1997, the equivalence agreements approved by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder and the Rectors' Conference of the Universities of Applied Sciences, together with the regulations set out within the context of university cooperation agreements, must be taken into account.

As long as it is already being applied by both parties, the basis of evaluation is the European Credit Transfer System (ECTS).

(3) Where grading systems are comparable, the grades will be adopted and used in calculating the cumulative grade.

(4) At most 50 percent of the knowledge and skills acquired outside higher education can be accredited to the university education, as far as they are pertinent and if content and level of the modules are equivalent to the course of study. The application is to be addressed to the Board of Examiners within eight weeks after start of the course. For purposes of recognition students must present the necessary original documents or certified copies thereof. The recognition of Master's theses and internship modules is not possible. Upon termination of the application period the recognition of skills and expertise acquired outside of the university is excluded.

§ 14 Types of examinations during the programme

(1) The type of examination can be found in the respective module description in the module handbook of the respective course of study one week before the start of the semester at the website of the faculty.

(2) The following types of examinations may be held during the programme:

1. Written examination (para. 3),
2. Oral examination (para. 4),

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3. Academic project (para. 5),
4. Term / academic paper (para. 6),
5. Oral presentation (para. 7),

(3) In a written examination that is invigilated and taken in a time-limited session with limited aids, students are required to demonstrate their comprehension of standard methodology and problem recognition and solving skills within their specific fields. A written examination shall last for a minimum of 120 and not longer than 240 minutes.

(4) In an oral examination, students should be able to demonstrate their capacity to recognise and classify complex issues from the specific topic under examination. As part of the oral examination, a reasonable number of written exercises may be set, provided that the oral character of the examination as a whole is not affected.

The oral examination shall take place with several examiners (panel examination) or with one examiner and an expert assessor in the form of an individual or group examination, whereby up to 3 students may constitute a group. The assessor is to be consulted before a final grade is given. As a rule, the duration of the examination for each student should amount to 30 minutes. The essential points of the examination and its evaluation must be recorded in writing. This record must be signed by the examiners and the assessors. The results are to be announced to the student directly following the presentation of the oral examination.

(5) By working on a joint academic project, students demonstrate their capacity to produce scientific work independently as well as to work in a team. Individual contributions to a project must be clearly discernible.

(6) A term / academic paper requires an experimental, empirical or theoretical approach to a specific subject from within the field of study. The nature of the task must allow it to be completed within the lecture period of the current semester. Students are free to propose topics and task definitions for their papers. However, their proposals shall not be legally binding. If required, the academic paper may be presented orally in a manner suitable to the vocational field in question. If students are more overburdened than normal with other examination work, the completion time may be extended only once by up to one half. In doing so, due consideration must be given to compliance with the standard course duration.

(7) An oral presentation encompasses:

- an independent and thorough written examination of a problem from within the context of the course of studies which takes into account and evaluates relevant literature, and
- a presentation of the work and communication of the results in an oral report and in the ensuing discussion. Written workings must be available.

(8) Assessment prerequisites (proofs of performance) may need to be satisfied as a condition of admission to a module examination. Failed examinations can be repeated arbitrarily. The conditions for satisfying assessment prerequisites and their type and scope must be announced by the lecturers at the start of the course (no later than three weeks after start of the course). It is stated in the module descriptions if performance records are required.

(9) Group projects are also a permissible form of examination. The contribution of each individual student must meet the examination requirements and be clearly discernible and

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assessable on the basis of sections, pages or other objective criteria. A group must not contain more than six students.

(10) The type and scope of the examinations for the individual modules can be found in the module handbook. The types of examination covered by these regulations (written or oral examination) may be amended under the following conditions:

- (a) If 12 or fewer candidates are registered or can be expected for an examination that is designated as a written examination, then upon application by the examiner, the Board of Examiners may agree to the examination being conducted orally instead. This approval shall only apply for one examination date. In case of re-examinations it is only granted if the first examination was also orally.
- (b) If 20 or more candidates are registered or can be expected for an examination that is designated as an oral examination, then upon application by the examiner, the Board of Examiners may agree to the examination being conducted in writing instead (duration: at least 120 minutes). This approval shall only apply for one examination date. In case of re-examinations it is only granted if the first examination was also in written form.

Students affected by a change to the form of examination must be notified without delay (by notice of the examination schedule).

Oral examinations of 30 minutes length must be replaced by written examinations of 120 minutes length; longer oral examinations (up to 60 minutes) must be replaced by written examinations of at most 240 minutes length. Inversely, written examinations of 120 minutes length must be replaced by 30 minutes long oral examinations and written examinations of 240 minutes must be replaced by oral examinations of at most 60 minutes.

(11) The examiner will decide which examination aids may be used in a written examination. Grades must generally be announced no later than 6 weeks after the examination.

(12) The regulations of the relevant faculties apply for module examinations in other faculties.

(13) Examinations can be conducted in German or English language.

§ 15 Protective provisions, compensation for disadvantages

(1) Where a student provides credible evidence (medical certificate) that, due to a prolonged or permanent illness, he or she is completely or partially unable to fulfil the examination requirements in the prescribed form, the Board of Examiners must provide the student with the possibility of taking equivalent examinations in a different form.

(2) Disabled students may be granted additional materials or aids to compensate for disadvantages, provided that this is necessary to establish equality of opportunity. To this end the duration of the assessment may be extended to a reasonable degree or approval may be given for the examination to be taken in a different form. A disabled student is defined as someone who, due to a protracted or permanent physical impediment, is not in a position to complete the examination in the prescribed form, either in whole or in part. The impediment must be substantiated. The University may require substantiation in the form of a medical

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certificate or submission of the student's certificate of disability. Compensation for disadvantages must be applied for in writing to the Board of Examiners. The application should be made no later than when registering for the examination.

(3) The protective provisions pursuant to the Maternity Protection Act and, in accordance with the time limits set out by the Federal Child-Raising Allowance Act as to parental leave, are to be strictly adhered to and promoted in applying these Study and Examination Regulations, especially in terms of the calculation of time limits. During a leave of absence granted on the grounds of family responsibilities, students are free to continue with their studies and examinations. Upon written application to the Board of Examiners, the repetition of a failed examination during the leave of absence is admissible.

§ 16 Public access to oral examinations

As long as they are not registered to take the same examination, students of this programme who have yet to successfully complete the respective examination may be present at the oral examinations as observers. This, however, does not include the counselling and notification of the students being examined regarding their examination results. Pursuant to sentence 1, a student may apply to exclude observers from his or her examination.

§ 17 Admission to participate in examinations during the programme

(1) Anyone who is enrolled at Otto von Guericke University on the course specified in §1 may be admitted to the examinations during the course.

(2) Students of this programme must apply for admission to the examinations and repeat examinations within the period of time specified by the Board of Examiners and in the form defined. Failure to comply with the registration deadline shall result in admission to the examination being refused, unless the Board of Examiners decides otherwise upon written application by the student.

(3) Suggested examiners and, where the corresponding documentation is not already in the possession of Otto von Guericke University, evidence of completed assessment prerequisites must be appended to the application for admission.

(4) The application may be withdrawn no more than one week prior to the respective examination date. In the event of a withdrawal, a new application for admission to the examination must be submitted in accordance with paragraphs 1 and 2 for a later examination date.

(5) The Board of Examiners is responsible for admission decisions. Admission must be refused if:

1. the requirements for admission are not fulfilled or
2. the documents are incomplete or
3. the module examination has been irrevocably failed or is deemed to have been irrevocably failed.

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§ 18 Assessment of examination results and determination of module grades

(1) Each examination is evaluated and graded by the respective examiners. For written examinations, grades should be announced no later than six weeks after the examination has been taken. The Board of Examiners can determine deadlines for the assessment of written examinations.

(2) The following grades are to be used for the assessment of examinations:

Grade

1	very good	an outstanding performance
2	good	a performance which is significantly above average
3	satisfactory	an average performance
4	sufficient	a performance which, in spite of its shortcomings, is considered to be sufficient
5	insufficient	a performance which, because of substantial shortcomings, does not meet the requirements

For the sake of greater differentiation, individual grades may be rounded up or down by 0.3; this does not apply to the following grades: 0.7, 4.3, 4.7 and 5.3.

(3) An examination is considered to have been passed if a minimum grade of "sufficient" is awarded. If an examination is graded by more than one examiner, it is considered to have been passed if all examiners award at least a grade of "sufficient". In this case, notwithstanding the regulation stipulated in paragraph 2, the grade awarded for the examination corresponds to the arithmetic average to one decimal place of the individual grades determined by the examiners.

(4) A module examination is considered to have been passed when the necessary examination has been awarded a grade of at least "sufficient". If a module examination comprises only one exam, the module grade equates to the grade of the examination. If a module examination comprises several exams, notwithstanding the regulation stipulated in paragraph 2, the grade awarded for the module shall correspond to the arithmetic average to one decimal place (and if necessary weighted) of all grades awarded for the examinations in the module.

(5) A multiple choice examination is deemed to have been passed if the examination candidate obtains at least 50 percent of the possible points score (absolute pass mark) or if the points score achieved by the candidate does not fall short of the average score of all candidates on the specific examination date by more than 22 percent (sliding scale pass mark). The sliding scale pass mark shall only apply if the examination candidate has achieved at least 40 percent of the possible points score. The difference between the relative and absolute pass mark shall be added for each examination candidate in order to determine the individual examination results. This paragraph shall only be applied if the proportion of examination questions in the multiple choice examination exceeds 50 percent.

(6) When arriving at a grade by means of averaging, only the first decimal place will be taken into account; all other decimal places will be disregarded. Grading structure:

For a grade average of	Grade
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up to and including 1.5	very good
from 1.6 up to and including 2.5	good
from 2.6 up to and including 3.5	satisfactory
from 3.6 up to and including 4.0	sufficient
from 4.1	insufficient

§ 19 Repetition of examinations

(1) Examinations that are failed or deemed to have been failed may be repeated. Repeat examinations must be taken no sooner than six weeks and by no later than 15 months after the failure of the examination, unless an extension is granted to the student for specific reasons that are beyond his or her control. The student must reregister for the examination. § 18 applies accordingly for the assessment. Should the student interrupt his or her course of studies, or in the case of other justified reasons, binding stipulations must be made by the Board of Examiners regarding the completion of repeat examinations. § 18 applies if the deadline for repetition of the examination should be missed.

(2) For written exams, the Board of Examiners determines the re-examination date and announces it in the student information system (currently: HIS–LSF).

(3) For all types of examinations, students are obliged to observe the time limits themselves. In case of failure to observe the time limit by the students, the respective examination is deemed as uniquely failed.

(4) Examinations can at most be repeated two times. A second repetition of an examination is only permitted for at most three examinations during the whole course of studies. If the first re-examination was an oral or a written examination, the second re-examination will be oral. If the first examination or the re-examination were in written form, the length of the oral examination is based upon the conversion formulas in §14 para. 10. For the time limits para. 1 applies accordingly.

(5) An examination that has been passed may not be repeated.

§ 20 Supplementary examinations

(1) Students may also take examinations in additional modules to those modules in the mandatory and mandatory elective parts of the course that are prescribed in the attached examination schedule.

(2) Upon request of the student, the results of supplementary examinations will be included in the academic transcript and/or certificates. The results of supplementary examinations are not taken into consideration when calculating grade point averages and when determining the cumulative grade.

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IV. Master's Thesis

§ 21 Master's thesis registration

(1) Only students who are enrolled at Otto von Guericke University in the course specified in § 1, who can demonstrate that they have obtained at least 90 credit points, shall be permitted to register for their Master's thesis.

(2) Students are to make a written application to the Board of Examiners for admission to write their Master's thesis. A proposal for the subject area with which the Master's thesis is to deal, and if necessary an application for the issuing of the subject as a group thesis, and, if necessary, suggested examiners, must be appended to the Master's thesis registration application.

§ 22 Issuing of the topic, submission and assessment of the Master's thesis

(1) The Master's thesis should demonstrate that students are capable of working independently and in a scientific manner within a given time frame on a particular problem. The topic and task definition of the Master's thesis must correspond to the purpose of the examination and the required period of time.

(2) The Master's thesis topic must be issued in due time such that the Master's examination can be completed within the standard period of study. Generally, the topic is issued at the beginning of the fourth semester. Upon application and if all requirements are fulfilled, the chair of the Board of Examiners ensures that the student receives a topic for his or her Master's thesis within a reasonable timeframe.

(3) Students should be given the opportunity to make proposals for the Master's thesis topic and task definition. Wherever possible, the student's proposal should be accepted. However, it shall not be legally binding. The topic is determined by the examiner after hearing of the examinees. Task-specific criteria for the assessment are revealed before the start of the Master's thesis. All partial performances are incorporated into the grading. The issuing of the subject must be recorded.

(4) The Master's thesis is issued and supervised by a person who is authorised to be an examiner in accordance with § 12 para. 1. This person must be a member of the faculty to which the course belongs. The task definition must be confirmed by a university lecturer. If several faculties are involved in a course, this person must belong to one of these faculties. In justified exceptional cases, the topic may, however, with the approval of the Board of Examiners, be issued by a person who is authorised to be an examiner who does not fulfil this condition. In this case, the second examiner must be a member of the faculty.

(5) The maximum time between the issuing of the topic and the submission of the Master's thesis is 22 weeks.

If the student is prevented from complying with this deadline for reasons beyond his or her control, the time for completing the thesis may be extended by at most two months upon written application to the board of examiners. An aborted attempt to write the thesis shall not be counted among the number of possible repetitions if the attempt is evidently not caused by the student.

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A justified application to extend the submission deadline by a maximum of two months must be submitted in due time by the student to the Board of Examiners following consultation with his or her supervisor.

With issuing of the topic, the first examiner, who determined the topic, is summoned. According to §12 para. 1, the examiners must be authorized. At least one examiner must belong to the group of university lecturers.

(6) The topic may only be returned once and only within the first third of the completion time. This is to be recorded at the examination office of the faculty. In case of withdrawal, the application for approval is to be made again at a later date.

(7) The Master's thesis may be completed in the form of a group thesis. The contribution of each individual student must be clearly discernible and assessable on the basis of sections, page numbers or other objective criteria, and meet the examination requirements as per paragraph 1. The group size is limited to 3 students.

(8) The Master's thesis must be written in German or English.

(9) Upon submission of his or her Master's thesis, a student must guarantee in writing that his or her thesis – or identified section in the case of a group thesis – has been written individually and that no sources or tools have been used other than those cited in the bibliography.

(10) The Master's thesis must be submitted by the deadline in two written, bounded copies as well as in a suitable digital form (PDF format) for plagiarism assessment to the examination office; the date of submission must be recorded. If the Master's thesis is not submitted within the time limit, it shall be graded as "insufficient".

(11) Examiners must review and grade the Master's thesis within four weeks from the submission date.

The Master's thesis shall be deemed to have been failed if all grades are "insufficient (5.0)". If one examiner grades the thesis as "insufficient (5.0)", a third examiner is summoned. Then, if two of the assessments are graded "insufficient (5.0)", the Master's thesis is deemed as failed.

If only one of the three assessments is graded "insufficient (5.0)", the Master's thesis is deemed as passed. In this case, the grade is calculated from the arithmetic average of the assessments. Notwithstanding, the thesis is graded with 4.0 if the arithmetic average is larger than 4.0.

The overall grade results from the assessment calculated by the arithmetic average with factor 2/3 and the assessment of the Master's colloquium with factor 1/3.

(12) The Master's thesis is to be made publicly available. A publication of scientific results in relevant literature must not be unreasonably excluded by contract. In this case, the Master's thesis will not be accepted for assessment by the Faculty of Computer Science. However, restriction notes with retention periods of at most 2 years are permitted.

§ 23 Colloquium

(1) The colloquium for the Master's thesis is the student's opportunity to demonstrate that he or she is capable of defending the results of his or her scientific work in an academic debate within the chosen field of studies.

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(2) For the student to be admitted to the colloquium the Master's thesis must have been graded at least "sufficient" and all examinations and achievements of at least 90 CP must be present.

(3) The colloquium on the Master's thesis will be held as an individual or group examination by the Master's thesis examiners. The Board of Examiners may appoint additional examiners. The topic of the Master's thesis and the associated problems and findings must be described in a maximum 25 minute-long oral presentation, after which questions regarding the presentation must be answered. In case of a group examination, the time shall be reduced to a maximum of 15 minutes per student. As a rule, the total duration of the examination for each student should be 60 minutes and not more than 75 minutes.

(4) The colloquium is successfully completed if the examiners award a minimum grade of "sufficient".

(5) The colloquium on the Master's thesis is open to all students, employees and visitors of the university. Generally, the colloquium is to be held at Otto von Guericke University Magdeburg or at associated institutions of Otto von Guericke University. A deviation is possible upon justified request to the Board of Examiners. It must be stated why a colloquium at Otto von Guericke University is not possible and how the publicness is guaranteed in this case. The application must be made in due time to enable to be discussed by the Board of Examiners before the defence date.

(6) 30 CP are awarded for the successfully defended Master's thesis and colloquium.

(7) The cumulative grade for the Master's thesis including the colloquium results from the arithmetic average of the grade of the first examiner, grade of the second examiner and the grade for the colloquium. §18 applies for the assessment.

§ 24 Repetition of the Master's thesis and the Master's thesis colloquium

(1) A Master's thesis may be repeated once with a new topic if it has or is deemed to have been graded as "insufficient".

(2) If a Master's thesis is repeated, returning a topic is only permissible if no use was made of this possibility the first time.

(3) The new topic of the Master's thesis will be issued in a timely manner, generally within three months.

(4) A second repetition is not permitted.

(5) Repetition of a successfully completed Master's thesis is not permitted.

(6) The colloquium for a Master's thesis may be repeated once if it has or is deemed to have been graded as "insufficient". The repetition must take place within 8 weeks.

(7) A second repetition of the Master's thesis colloquium is not permitted.

(8) Repetition of a successfully completed Master's thesis colloquium is not permitted.

§ 25 Overall result of the Master's degree

(1) The Master's examination shall be deemed to have been passed if all mandatory and mandatory elective module examinations required in accordance with the study schedule and the Master's thesis and colloquium have been awarded a minimum grade of "sufficient".

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(2) The cumulative grade of the Master's examination is calculated from the weighted average of the grades for the module examinations and the module grade of the Master's thesis with the colloquium. § 18 para. 5 applies accordingly.

(3) If the average of the cumulative grade is better than 1.2, then the classification "passed with distinction" shall be awarded.

(4) A Master's examination shall be deemed to have been irrevocably failed when a course examination or Master's thesis and colloquium have received a grade of "insufficient" or are deemed to have been graded "insufficient" and no further repetitions are permitted.

§ 26 Academic transcripts and certificates

(1) Academic transcripts are to be issued without delay, if possible within four weeks of the Master's examination having been passed. The transcript bears the date on which the last examination was completed. It must be signed by the chair of the Board of Examiners and stamped with the Otto von Guericke University stamp.

(2) The transcript will include the module grades, the grade for the Master's thesis and the cumulative grade and ECTS grade. Furthermore, the transcript will indicate the topic of the Master's thesis.

(3) Together with their transcripts, students receive a Diploma Supplement.

(4) If the Master's degree is not awarded or is deemed to have been failed, the Board of Examiners will issue the student with written notification of this fact, including information regarding whether and to what extent examinations may be repeated. The notification about an irrevocably failed Master's examination is to be provided with information on legal remedies.

(5) If students choose to leave the University or change their programme of studies, upon application they will be issued with a certificate showing the examinations taken and grades achieved. This will indicate the examinations remaining to be completed as well as whether or not the Master's examination has been failed or irrevocably failed. In case of para. 4, the certificate is also issued without request.

§ 27 Degree certificate

(1) With the transcript, students also receive a degree certificate bearing the same date as the transcript. This also includes the certification of the award of the title of Master.

(2) The degree certificate is signed by the Dean and the Chair of the Board of Examiners of the Faculty of Computer Science of Otto von Guericke University, and is also provided with the Otto von Guericke University stamp.

V. Final Provisions

§ 28 Accessing the examination files

Up to one year after completion of their degree, upon written application students are entitled to view their study and examination records. The application must be submitted to the Board

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of Examiners at the Faculty of Computer Science. The chairperson of the Board of Examiners will determine the time and place for reviewing the documents.

§ 29 Non-attendance, withdrawal, cheating, breach of regulations

(1) An examination will be deemed to have been graded "insufficient" when students, for no good reason:

- do not attend a mandatory examination date,
- withdraw from the examination after it has already begun,
- do not adhere to the deadline,
- or do not retake an examination within the established time frame.

(2) The justifications provided for any withdrawal or non-attendance must be credible and immediately presented to the Board of Examiners. Otherwise, the examination will be graded as "insufficient". In case of illness, a medical report must be presented. Unless the Board of Examiners resolves otherwise, upon recognition of the reasons for non-attendance or withdrawal, the examination must be taken on the next regular examination date.

(3) An examination will be graded "insufficient" if a student attempts to alter the results through deceit or the use of other unauthorized means. Examiners and supervisors are authorized to exclude from further participation any student who disrupts the orderly conduct of the examination. If this is the case, the examination will be graded as "insufficient". In extreme cases, the Board of Examiners is authorised to exclude the student from any further examinations.

§ 30 Invalidity of examination results

(1) If a student has cheated in an examination and this becomes known after the degree has been awarded, the Board of Examiners is authorised to declare an examination to have been failed either partially or in its entirety.

(2) If a student has deliberately used unfair means to gain admission, the Board of Examiners, taking into consideration relevant legal regulations, will decide as to the revocation of unlawful administrative deeds.

(3) Prior to such a decision, the affected student is to be given the opportunity to make a statement on the matter to the Board of Examiners.

(4) The incorrect transcript must be recovered, and if necessary replaced with a new transcript or certificate in accordance with § 26 para. 5. The Master's degree certificate must be recovered, if the Master's examination is declared to have been failed as a result of the act of deception. No decision may be made in accordance with paragraphs 1 and 2 after a period of five years from the date of the transcript being issued has elapsed.

§ 31 Decisions, appeal procedure

(1) All decisions made in accordance with these Examination Regulations, and which constitute an administrative deed, are to be justified in writing and provided with instructions on appeal in compliance with Art. 41 of the Administrative Procedures Act of Saxony-Anhalt (VwVfG LSA). An appeal against this decision may be submitted within one month of notification. The appeal

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must be submitted in writing or by recorded declaration to the Board of Examiners of the Faculty of Computer Science.

(2) The Board of Examiners will decide as to the validity of the appeal. If the appeal involves a grade, the appeal will be sent to the examiner or examiners for their review. The Board of Examiners will declare the objection to have been remedied if the grade is changed in accordance with the appeal. Otherwise, the Board of Examiners shall only review the decision in terms of

1. whether or not the examination procedures were properly conducted,
2. whether or not the examiner relied on unfounded facts or circumstances,
3. whether or not generally valid principles of grading were applied,
4. whether or not the examiner was influenced by immaterial considerations.

§ 32 Withdrawal/revocation of the academic title

Withdrawal or revocation of the Master's degree is in accordance with § 20 of the Universities Act of Saxony-Anhalt.

§ 33 University-wide announcements by the Board of Examiners

Decisions and other measures relating to these Examination Regulations, especially with regard to admission to examinations, refusal of admission, registration and examination dates and deadlines as well as examination results, will be made known University-wide in the institution's customary manner. In doing so, data protection regulations will be observed.

§ 34 Transitional Regulation

These regulations shall apply to all students who enrol in the course Data and Knowledge Engineering or Digital Engineering from the summer semester 2016. Students who were already enrolled in the course Data and Knowledge Engineering or Digital Engineering before 01.04.2016 may apply to accede to these regulations. The application must be submitted in writing to the Board of Examiners for the Faculty of Computer Science. It may not be revoked.

§ 35 Effective date of regulations

These Study and Examination regulations shall enter into force on the day after they are published in the official announcements of Otto von Guericke University.

Issued by virtue of the resolutions of the Faculty Council of the Faculty of Computer Science dated 13.01.2016 and the Senate of Otto von Guericke University dated dd.mm.2016.

Magdeburg, dd.mm.2016

Prof. Dr.-Ing. habil. Jens Strackeljahn

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President
of Otto von Guericke University Magdeburg

Appendices: 1.) Study and examination schedules
2.) Programme objectives

Study and examination schedules for the Master’s degree courses in DKE and DigiEng

Appendix A: Study and examination schedule DKE

The study course “Master DKE” consists of a series of topics that are stated in the study and examination schedule below. Each subject area contains the numbers of CPs (or the minimum and maximum numbers) which must be obtained:

- 1.) In the subject area “Fundamentals”, modules with a total of 30 CP must be selected.
- 2.) In the subject area “Models”, at least 12 and maximally 24 CP must be obtained from the modules: knowledge representation, modelling and editing.
- 3.) In the subject area “Methods I”, at least 12 and maximally 24 CP must be gained from the modules: learning methods.
- 4.) In the subject area “Methods II”, at least 12 and maximally 24 CP must be obtained from the modules: methods of information processing and seeking.
- 5.) In the subject area “Applications”, at least 12 and maximally 24 CP must be obtained from the modules: application areas of DKE.
- 6.) In one of the topics “Models”, “Methods I”, “Methods II”, “Applications” also a team project (6 CP) is required. The topics of the team project can be overlapping.

The modules assigned to each of the topics “Models”, “Methods I”, “Methods II” and “Applications” will be published before the start of each semester.

This study and examination schedule is a recommendation which considers the general requirements of the topics “Models”, “Methods I”, “Methods II” and “Applications”. Students may deviate from this recommendation by selecting modules from: “Fundamentals”, “Models”, “Methods I”, “Methods II” and “Applications” in different order.

Legend for study and examination schedule:

CP = Credit points

No		1 st Semester (CP)	2 nd Semester (CP)	3 rd Semester (CP)	4 th Semester (CP)	Σ
1.	Topic “Fundamentals” (30 CP)	30				30
1.1	Data Mining	5				
1.2	Machine Learning	5				
1.3	Intelligent Data Analysis	5				
1.4	Information Retrieval	5				
1.5	Databases II	5				
1.6	Visualization	5				
1.7	Complexity Theory	5				
	Advanced Topics (60 CP)		30	30		60

2.	Models (12–24 CP)					
3.	Methods I (12–24 CP)					
4.	Methods II (12–24 CP)					
5.	Applications (12–24 CP)					
6.	Master's Thesis (30 CP)				30	30
	Σ CP	30	30	30	30	120

Appendix B: Study and examination schedule DigiEng

The study course “Master Digital Engineering” consists of a series of topics that are stated in the study and examination schedule below. For each subject area, the minimum number of CPs to be obtained is specified:

1. In the subject area “Fundamentals of Computer Science” a selection of modules with at least 15 CP (if no bachelor's degree in computer science exists) or at least 5 CP (if a bachelor's degree in computer science exists) must be taken.
2. In the subject area “Engineering Fundamentals” a selection of modules with at least 5 CP (if no bachelor's degree in computer science exists) or at least 15 CP (if a bachelor's degree in computer science exists) must be obtained.
3. In the subject area “Methods of Digital Engineering” modules with at least 10 CP have to be selected.
4. In the subject area “Methods of Computer Science” a selection of modules with at least 10 CP must be taken.
5. In the subject area “Technical Specialization” modules with at least 15 CP must be chosen.
6. In the subject area “Human Factors” a selection of modules with at least 5 CP is required.

In addition, an interdisciplinary team project (6 CP) and a digital engineering project (12 CP) are mandatory. The remaining CPs can be freely combined from modules of the study course. The attached study and examination schedule is a recommendation for the arrangement of the subject areas. The students may deviate from this recommendation by taking modules in a different order.

Legend for standard study plan:

CP = Credit Points

No	Topics	1 st Semester (CP)	2 nd Semester (CP)	3 rd Semester (CP)	4 th Semester (CP)	Σ
1	Fundamentals of Computer Science	18 or 6				
2	Fundamentals of Engineering	18 or 6				
3	Human Factors	6				

4	Methods of Digital Engineering		12			
5	Methods of Computer Science		12			
6	Interdisciplinary Team Project		6			
7	Technical Specialization			18		
8	Digital Engineering Project			12		
9	Master's Thesis				30	
	Σ CP	30	30	30	30	120

2. Programme objectives

2.1. Master programme Data & Knowledge Engineering

The Master degree programme Data & Knowledge Engineering is a Computer Science programme with the following focuses:

- (I) Methods I: Data Mining Methods and Methods of Machine Learning
- (II) Methods II: Methods of Information Processing and Search
- (III) Models: Modelling Concepts and Tools for Knowledge Representation and Knowledge Processing
- (IV) Applications: Applications of Data Science and
- (V) Fundamentals: Fundamental methods (on which parts I to V are based).

The Master programme Data & Knowledge Engineering is research-oriented. It qualifies for independent scientific work and lays the foundation for further development of Data Science. It prepares for admission to dissertation research leading to a doctoral degree. It qualifies for self-dependent and leading functions in Data Science. It is characterised by scientificity, support of independence, closeness to research, and the ability to judge and make decisions.

The Master programme Data & Knowledge Engineering aims to enable students for independent research and development activities in Data Science. They will be familiarised with the methods, functioning and thinking of Data & Knowledge Engineering and will be able to apply and adapt the learned methods and models to new problems. They especially gain competencies that are required to:

- successfully handle tasks for the extraction of knowledge from data on a theoretical and practical basis,
- realise decision-making processes through data analysis,
- handle complex problems of data processing for conventional and multimedia data,
- design and realise solutions for information retrieval, storage and reproduction.

Furthermore, graduates gain expertise about modelling approaches and methods of Data & Knowledge Engineering and insights into the diverse application fields of this subject area. The programme enables graduates to take over challenging tasks and leading functions during the planning and realisation of DKE-related projects.

According to the goals stated above, the graduate gained the following qualifications: Knowledge and understanding, and skills (knowledge discovery)

Knowledge and Understanding

Broadening of Knowledge

The graduate is enabled to define, interpret and enhance the characteristics, limitations, terminologies and doctrines in Data Science (divided into the 5 domains stated above).

Deepening of Knowledge

The graduate has a broad, detailed and critical understanding of knowledge in Data Science and is able to responsibly design, implement and evaluate methods of Data & Knowledge Engineering and to apply them to real problems.

Skills (Knowledge discovery)

The graduate can apply his or her knowledge to solve problems related to Data Science. He/she can develop new methods and recognises which available methods are applicable to a Data Science problem, and how they should be augmented, if necessary.

2.2. Master programme Digital Engineering

Digital Engineering is a special educational programme that takes account of the increasing software penetration in technical disciplines. This causes new challenges that can only be mastered through interdisciplinary thinking. The Master programme aims to convey such cross-disciplinary education to the students. Hence, they can choose between the engineering disciplines: electrical engineering, mechanical engineering, logistics and information technology (as well as related disciplines).

The Master programme Digital Engineering can be studied by graduates with a Bachelor degree in Computer Science or in an Engineering discipline. Depending on the students' background, a variable study plan is applied. Students with background in an Engineering Science choose more subjects in Computer Science than in an Engineering discipline. On the contrary, students with background in Computer Science choose more subjects in an Engineering discipline than in Computer Science.

The Master programme Digital Engineering is research-oriented. It broadens and deepens the in-depth knowledge acquired in a respective Bachelor programme, qualifies for independent scientific work, lays the foundation for further development of the subject and prepares for admission to dissertation research leading to a doctoral degree. Particularly, it qualifies for self-dependent and leading functions and is characterised by scientificity, support of independence, closeness to research, and the ability to judge and make decisions. The interdisciplinary relation is further strengthened. Thus, the amount of practical, interdisciplinary teamwork in individual projects is very high. Cross-disciplinary cooperation and social competence are especially supported.

The Master programme Digital Engineering deepens the knowledge of mathematical and computational methods, the programming-related handling of complex problems, the ability to work in teams, the sensitisation for non-technical requirements as well as the familiarisation with aspects of the interdisciplinary field.

The specific goals are:

- Graduates have worked up the educational objectives of the Bachelor programme during a longer subject-specific process. They became more secure in applying and realising professional and extracurricular competencies.
- They possess profound knowledge in a selected focus area of Computer Science.
- They can quickly familiarise with future technologies and topics related to their own subject area.

- They are able to create and design IT systems, to supervise computing systems throughout their lifecycle and to take over management tasks. This includes to understand IT systems (e.g. in different fields of industry, services, research and public services) from the strategic level to operationalisation up to methodological bases.
- They gained different technical and social skills which prepare them for managerial functions (abstraction capability, system-analytic thinking, team and communication skills, international and intercultural experiences etc.).
- They became acquainted with scientific work in fundamental research.

The study organisation of the Master programme Digital Engineering is rather self-determined. Since the programme offers more freedom of choice and integrates research, students can evolve into more mature scientists.