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## **Examination regulations for the Master's programme in Manufacturing Technology (MMT) at the Technische Universität Dortmund from 26th January 2016**

Based on article 2 paragraph 4 in connection with 64 paragraph 1 of the Higher Education Act of the Land North Rhine-Westphalia (Hochschulgesetz – HG) of 16th September 2014 (GV. NRW. S. 547), Technische Universität Dortmund has issued the following regulations:

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## **I. General Provisions**

### **§ 1**

#### **Scope of the Master's examination regulations**

- (1) These Master's examination regulations apply to the Master's programme in Manufacturing Technology of the Faculty of Engineering at Technischen Universität Dortmund. According to article 64 Hochschulgesetz NRW (Higher Education Act for the Land North Rhein-Westphalia) they define the structures of the Master's programme.
- (2) The module descriptions include information on the individual elements of study, contents and competences to be acquired. They are not an inherent part of the examination regulations. They are determined by the appropriate faculty boards and need to be communicated to the Rector's office.

### **§ 2**

#### **Purpose of the programme and the examinations**

- (1) The aim of this programme is the gaining of advanced knowledge, skills and competences in the field of manufacturing and production technology. The connection of scientific, theoretical coursework and practical study elements turns the graduates into specialists in demand in the production technology sector.
- (2) The consecutive Master's programme builds upon a Bachelor's degree. Passing the Master's programme brings a further professional qualification which qualifies the graduate for further scientific work and generally entitles them to do their PhD. By successfully completing the programme, the candidates demonstrate their profound knowledge of production engineering.

### **§ 3**

#### **Preconditions for admission**

- (1) The precondition for the Master's programme is an appropriate Bachelor's degree in engineering in a degree course of at least six semesters with a total of 180 credit points at a state university or state-approved university in the scope of the Basic Law or at a university beyond the scope of the Basic Law as long as the Admissions Committee has established that the Bachelor's degree is classed as suitable.
- (2) A Bachelor's degree is considered appropriate if the programme includes the following technical content:
  - a. Mathematics covering at least 18 credit points (ECTS);
  - b. Mechanics covering at least 12 credit points (ECTS);
  - c. and materials engineering, production engineering, theory of design and/or metrology and control engineering covering at least 20 credit points (ECTS).
- (3) The admission committee is responsible for determining the preconditions for admission.

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- (4) In addition to the stated preconditions according to paragraph 1, applicants must fulfil the following criteria:
- (5) The overall grade in the appropriate degree according to paragraph one must correspond to at least the grade “good” (1.9) or better, or in the case of a degree issued in another country the equivalent of the grade good (1.9) or better in the customary grading system for that country. If this overall grade was not achieved, the suitability of the student can be established by the Admissions Committee when the overall picture of the application leads to believe that the student has the technical knowledge to cope with the Master’s programme. In this case, the Admissions Committee can invite the applicant to an interview to discuss their personal situation.
- (6) As the Master’s programme is solely in English, sufficient knowledge of the English language is a prerequisite. If the applicant’s native language is not English and if the Bachelor’s degree was not taken in an English language degree programme, the applicant must prove their knowledge of English before admission into the Master’s programme. This is considered to have been proven if the applicant submits a certificate (e.g. TOEFEL: paper based: 550; computer based: 213; internet based: 80, IELTS: minimum score: 6.5, Cambridge First Certificate) which corresponds to Level B of the Common European Reference Framework for languages. The Admissions Committee determines if the certificate is admissible. Knowledge of German is not a prerequisite.
- (7) Submitting a certificate for a written aptitude test (GRE-Test, Graduate Record Examination) is strongly recommended for all applicants.
- (8) An Admissions Committee decides on exceptions, requirements and the admission of students. The Admissions Committee is appointed by the Faculty Board for a period of two years. The committee consists of at least two professors and one scientific member of the Faculty of Engineering. The sessions of the Admissions Committee are closed. In the normal course of business, the committee can confer the execution of certain tasks (e.g. rapid decisions) to the Chairman. This is not the case for decisions regarding appeals. The committee shall have a quorum when at least two of the members from the group of professors are present.
- (9) If the applicant has not yet been awarded his or her Bachelor degree, the Admissions Committee may admit the applicant to his or her preferred Master’s programme when he or she can provide evidence that all of the examinations of the Bachelor’s programme have been passed according to paragraph 1. The Bachelor’s degree certificate must be submitted within a period of six months.

#### **§ 4 Master’s degree**

On the basis of having successfully completed the Master’s examination, Technische Universität Dortmund – through the Faculty of Engineering – will award the degree “Master of Science” (“MSc”).

## **§ 5** **Credit point system**

- (1) The programme is based on a credit point system which is compatible with the European Credit Transfer System (ECTS). For the Master's programme, a total of 120 credit points needs to be acquired by participating in the modules, taking the corresponding exams and submitting the Master's thesis.
- (2) A number of credit points is assigned to every module according to its workload. In terms of these examination regulations, a credit point corresponds to a ECTS point and is awarded for a workload of approximately 25 to 30 hours. Normally, 30 credit points need to be acquired per semester.
- (3) Credit points are awarded after having successfully completed the respective modules.

## **§ 6** **Standard period of study, scope and structure of the programme**

- (1) Starting in the winter semester, the standard period of study is four semesters, including time spent working on the Master's thesis.
- (2) The Master's programme covers in total 120 credit points or 3000 to 3600 study hours which are divided into compulsory and elective subject areas. This includes time for independent preparation and review of the courses.
- (3) The programme is organised into modules which may only be studied for two consecutive semesters. The modules are self-contained and coordinated thematically and time-wise and usually total at least 5 credit points. Apart from lecture-based modules, the scope of studies also includes compulsory laboratory work, interdisciplinary qualifications, project work as well as the final Master's thesis. The programme schedule and the module overview can be found in the appendix.
- (4) Courses are held in English. The non-technical elective subject or the module for interdisciplinary qualifications is offered in English, and, if available, in other languages
- (5) The programme may be started in the winter semester.
- (6) The modules are organised as follows:
  - a. Modules based on lectures are taught in the first and second semester. There are three detached compulsory modules (C) as well as several elective modules (E) from which modules covering a total of 30 credit points must be chosen.
  - b. Modules with a practical character: one in laboratory work, one in project work and an interdisciplinary qualification, each to be completed in the third semester.
  - c. The final Master's thesis is scheduled for the fourth semester.
- (7) The structure of the Master's programme and the modules, including the credit points that must be acquired and the examination forms (module examination or partial performance, graded or ungraded), are displayed in the appendix of these examination regulations.

## **§ 7**

### **Admission to courses with a limited number of participants**

- (1) The courses of the Master's programme in manufacturing technology can be limited in the number of participants allowed according to article 59 paragraph 2 clause 1 Hochschulgesetz Nordrhein-Westfalen.
- (2) The Faculty Council of the Faculty of Engineering determines the limitation of the number of participants as well as the maximum number of the same for each course and this will be published in a suitable way.
- (3) If the number of applicants exceeds the capacity of the course, places will be awarded according to criteria stipulated in these regulations under the responsibility of the academic Dean of the Faculty of Engineering within the specified published time limits. The academic Dean is supported in exercising his or her responsibilities by the appropriate professorship. Applicants will be considered in the following order:
  - a. Students who are dependent on attending the course according to their study progress, as long as they are enrolled in the Master's programme of Manufacturing Technology at Technischen Universität Dortmund or are approved as visiting students according to article 52 paragraph 2 Hochschulgesetz Nordrhein-Westfalen.
  - b. Students who are dependent on attending the course are those for whom lectures are intended according to the module description of the module manual and the study schedule for the Master's programme Manufacturing Technology in this semester, and also students who, according to the standard period of study, are in the last semester of their Master's programme in Manufacturing Technology or a later semester and need the course to finish their Master's programme within the standard period of study or shortly after.
  - c. Students who are not dependent on attending the course at this time according to their study progress as long as they are enrolled in the Master's programme of Manufacturing Technology at Technischen Universität Dortmund or are approved as visiting students according to article 52 paragraph 2 Hochschulgesetz Nordrhein-Westfalen.
  - d. Students who are approved as visiting students for the course according to article 52 paragraph 1 Hochschulgesetz Nordrhein-Westfalen.
  - e. Other students at the Technischen Universität Dortmund as long as they fulfil the prerequisites for attending the course.
- (4) If a selection is necessary within one of the groups, applicants are to be considered in the following order:
  - a. Students with long-lasting or permanent physical disabilities, chronic illnesses or nursing requirements (children living in the household needing care, caring for spouses, registered partners or a relation in the direct line or an in-law in the first degree, as long as they are in need of care).
  - b. Students who applied for a place in the course unsuccessfully in at least one of the previous semesters.
  - c. Students for whom it is essential to repeat a course in the appropriate module.

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- d. Students who have attended all of the recommended courses in the module description that should be attended beforehand.
  - e. If these criteria have been exhausted, the places will be drawn by lot.
- (5) The existence of the conditions connected to the criteria according to paragraph 4 must be communicated to the course lecturer during the application process by the applicants themselves within the published time limits.
- (6) The Faculty of Engineering will ensure, with all the means at its disposal, that the students referred to in paragraph 3 section 1 either do not miss any semesters or only one at the most due to the limits of the numbers of participants

## **§ 8**

### **Examinations and compensating for disadvantages**

- (1) Modules are normally completed by an examination. In exceptional cases, several modules may be completed by one examination. The module is completed by a graded module examination. By way of exception, a module may be successfully completed by cumulative, graded partial performances. Partial performances are provided within the framework of individual courses. Modules in the first two semesters may also be completed by an ungraded module examination or ungraded partial performances. The form of the examination (module examination or partial performance / graded or ungraded) can be found in the appendix of these examination regulations.
- (2) The module examinations and partial performances are to be taken alongside the course, especially in the form of papers, presentations or designing seminars, seminar papers, oral examinations, poster or project presentations with or without disputation and subject-related practical examinations. The responsible tutors may define other suitable forms of examination with the permission of the Board of Examiners. The form and scope of the examinations are determined in the module descriptions.
- (3) Modules are normally completed by an examination. In exceptional cases, several modules may be completed by one examination. The module is completed by a graded module examination. By way of exception, a module may be successfully completed by cumulative, graded partial performances. Partial performances are provided within the framework of individual courses. Modules in the first two semesters may also be completed by an ungraded module examination or ungraded partial performances. The form of the examination (module examination or partial performance / graded or ungraded) can be found in the appendix of these examination regulations.
- (4) Examination performances are normally assessed by an examiner. In the case that the examination is the ultimate permissible repeat examination or that the programme is completed by the examination, the assessment of the examination performance by two examiners is mandatory (article 65 paragraph 2 Hochschulgesetz Nordrhein-Westfalen). Moreover, oral examinations are always conducted as an individual examination or a group examination with no more than five students by several examiners or by one examiner in the presence of an expert assessor.

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- (5) The responsible lecturers or examiners will give due notice of the examination dates at the beginning of each course. Students need to register for the examinations at the relevant examination office no later than two weeks before the examination date. The registration period must consist of at least two weeks. Students will receive more detailed information regarding their registration for their examination(s) at the beginning of the course by the lecturer responsible for the given course. Deregistering without giving reason is possible for an oral exam up to a week before the date of the given exam and for a written exam up to a day before the date of the given exam. The student is then no longer registered for the exam.
- (6) For module examinations, at least one hour to a maximum of 4 hours are provided for written tests; no less than 15 and no more than 45 minutes shall be provided for oral examinations. Regarding partial performances, at least 1 hour to 3 hours maximum shall be provided for written tests and no less than 15 and no more than 30 minutes per student for oral examinations.
- (7) Written tests shall be invigilated and are non-public. Any authorised aids will be disclosed by the responsible lecturer before the examination. The results of written examination performances need to be announced to the students after two months at the latest, but at least four weeks before the students retake the corresponding examination. Hereby the requirements of data protection should be observed.
- (8) For oral examinations, the essential subjects and results of the examination shall be recorded in the minutes of the examination. If an oral examination is taken in front of one examiner, they must consult the expert assessor before the grade is determined according to paragraph 16 section 1. If an oral examination is taken in front of two examiners, each examiner will set a grade for the oral examination performance according to paragraph 16 section 1. The grade of the oral examination performance is to be determined from the arithmetic average of both individual grades according to paragraph 16 section 6. If only one of the examiners grades the oral examination performance as at least “satisfactory” (4.0), the examination will be repeated in front of two different examiners, determined by the examination board, without counting it as a failed attempt. The result shall be announced to the student subsequent to the examination. Students intending to take the same examination at a later date are, in accordance with the space available, permitted as auditors unless the student being examined disagrees. The admission as an auditor does not allow for the consultation and announcement of the result. If the examination is influenced or disturbed the auditor may be barred from the examination by the examiner(s).
- (9) In modules which are completed by a module examination, specific performances may be required in individual courses. These may be: presentations, academic papers, graded student experiments, practical exercises, written or oral performance reviews, lectures or protocols. In both form and scope, the requirements of these performances are distinctly below those of an examination. Provided that the type of performance is not defined in the module descriptions, the lecturer shall announce the requirements at the beginning of the course. Student performances may be graded or rated as “pass” or “fail”. In order to participate in the module examination, the candidate must successfully complete all of the student performances required in the module. Participation in these student performances may also be declared voluntarily.
- (10) Students can be obliged to attend field trips, language courses, internships, practical exercises or comparable courses or seminars in which regular and active student participation is necessary and commensurate for achieving the specific academic goals of the course. This is determined by the lecturer in coordination with the examining board according to the principle of proportionality. Hereby a case-by-case assessment should be made considering the particular characteristics of the course to concretely determine to what extent attendance is compulsory for achieving the academic goals and if they are

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not achievable by less restrictive means, e.g. individual private study or in private study groups. Only under these narrow conditions is an encroachment of the freedom to study legitimate under the aspect of constitutional justification. Moreover, this means that a general assessment of the necessity of compulsory attendance without considering individual cases is always impermissible. The exact arrangements of compulsory attendance will be announced to the students in an appropriate form at the beginning of the course.

- (11) In the case that students substantiate by medical certificate that they cannot take an examination (entirely or partially) in the scheduled form or within the fixed period due to prolonged or permanent physical handicap or chronic disease, the Chairman of the Board of Examiners shall set an alternative form or period for the examination to be taken. In case of doubt, the relevant person or office responsible for handicapped students' issues (e.g. the division "Disability and Studies" inside the Centre for Higher Education at Technischen Universität Dortmund must be consulted. Examination procedures take the legal maternity periods into account as well as times absent due to children living in the household needing care, caring for spouses, registered partners or a relation in the direct line or an in-law in the first degree, as long as they are in need of care.

## **§ 9**

### **Repeating examinations, passing the Master's exam, definitive failure**

- (1) The module examinations and the individual partial performances can be repeated twice if they have not been passed or are considered as not passed. If a partial performance was not passed, only this is to be repeated. Once passed, examinations may not be repeated.
- (2) Deviating from paragraph 1, the Master's thesis may only be repeated as a whole and then only once with a new topic. Returning the topic of the Master's thesis according to paragraph 17 section 6 is only permissible if the candidate had not used this option when preparing the unsuccessful Master's thesis.
- (3) Definitively failing an elective module can be compensated by successfully completing other elective modules.
- (4) Changing an elective module after the first examination has not been passed is possible twice and only as long as none of the examinations pertaining to the module have been definitively failed.
- (5) The opportunity of repeating a failed examination must be provided within eight weeks after announcing the results of the examination. Participation in the repeat examination after having failed is obligatory. Students failing to register for the repeat examination within two weeks after the date of the examination has been announced lose the right to take the examination unless they can prove that they are not at fault for having failed to meet the registration deadline. The Board of Examiners decides on exceptions from this regulation. The deadline is extended in the cases pertaining to article 64 paragraph 3a Hochschulgesetz Nordrhein-Westfalen by the periods of time indicated in the same.
- (6) If the second repeat examination is taken in written form, and is graded "insufficient" (5.0) the student must take an oral supplementary examination. Article 8 paragraph 4 and article 8 paragraph 16 apply accordingly to the examination. On the basis of the oral supplementary examination, the grade "sufficient" (4.0) or "insufficient" (5.0) will be awarded. The oral supplementary examination must take place within 12 weeks of the announcement of the examination results. The overall result must be recorded in minutes which must be disclosed to the student directly after the oral supplementary exam. An oral supplementary exam may not be taken when the grade "insufficient" (5.0) is awarded as a result of attempted cheating, non-compliance or withdrawal without cause according to article 13.



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- (7) The Master's examination is passed when all 120 credit points earned through module examinations and partial performances have been acquired.
- (8) The Master's examination as a whole is finally rated as failed when
  - a. the Master's thesis has been repeated and has again been rated as failed or is considered as failed or
  - b. the student can no longer acquire the required minimum number of credit points or
  - c. one of the compulsory modules in the appendix has finally been rated as failed.
- (9) If the Master's examination is finally rated as failed or when one examination performance is considered as failed, the Chairman of the Board of Examiners will send the candidate written notification. The notification shall include information on legal remedies. On request, the candidate may be issued a certificate for the examinations which have been successfully taken; this includes the information that this certificate is not intended for submission at other universities.

## **§ 10** **Board of examiners**

- (1) The existing Board of Examiners at the Faculty of Engineering shall be entrusted with the tasks corresponding to the organisation of examinations and the tasks resulting from these examination regulations.
- (2) The Board of Examiners consists of seven members, namely four from the group of professors, one member from the group of academic staff and two members from the group of students. The members are elected according to their group for two years while the members from the group of students are elected for one year. The Board of Examiners shall elect the Chairman as well as the Deputy Chairman from the group of professors. The Faculty Board elects representatives for the members of the Board of Examiners with the exception of the Chairman and his/her deputy. Re-election is permissible. The composition of the Board of Examiners shall be announced by the Dean.
- (3) The Board of Examiners shall ensure that the provisions of the examination regulations are complied with and that examinations proceed as scheduled. It shall in particular be responsible for resolutions regarding objections to decisions made in the course of the examination procedures and for decisions on cross-faculty questions and problems. Moreover, the Board of Examiners shall report to the faculty board regularly, at least once a year, on the development of examinations and periods of study. It shall make suggestions regarding the reform of the examination regulations and the curriculum. The Board of Examiners may transfer certain current tasks (e.g. issues of validation, decisions to be made at short notice etc.) to the Chairman. This does not apply to decisions regarding objections and the report to the Faculty Board.
- (4) The Board of Examiners shall have a quorum when, apart from the Chairman or his or her deputy and two further members from the group of professors, at least two more members entitled to vote are present. The Board of Examiners decides with a simple majority. In the event of a tie, the vote of the Chairman decides. Student members do not participate in educational-academic decisions. These are in particular assessments, accrediting performances, setting examination questions and nominating examiners and assessors.

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- (5) The members of the Board of Examiners may be present at examinations.
- (6) Meetings of the Board of Examiners are not open to the public. The members of the Board of Examiners, their representatives, the examiners and the assessors are subject to official secrecy. In the event that they are not in state employment, the Chairman shall oblige them to secrecy.
- (7) The current business of the Board of Examiners is accomplished by the Central Examination Administration (Zentrale Prüfungsverwaltung ) of Technischen Universität Dortmund.

## **§ 11 Examiners and Assessors**

- (1) The Board of Examiners appoints examiners and assessors according to the statutory provisions. It may transfer the appointment to the Chairman of the Board of Examiners. Professors and other authorised persons according to article 65 paragraph 1 Hochschulgesetz Nordrhein-Westfalen may appointed as examiners. A person having completed a diploma or Master's examination in the corresponding subject or being able to prove relevant qualifications may be appointed as an assessor.
- (2) Examiners shall carry out their activities as examiners independently.
- (3) Candidates may propose examiners for the Master's thesis. Where possible, these proposals shall be taken into account. However, no objections may be made based on a proposal made by a candidate.

## **§ 12 Accrediting performances, placement in higher semesters**

The valid version of the regulations for accrediting performances and placement in higher semesters for all Bachelor and Master's programmes at the Technischen Universität Dortmund shall be used for the purposes of accrediting performances and placement in higher semesters.

## **§ 13 Non-attendance, withdrawal, deception and infringement**

- (1) An examination shall be deemed to be graded "insufficient" (5.0) or "failed" when the candidate does not appear on the date of the examination without good reason or when he or she withdraws from the examination without good reason after it has begun. The same applies to written examinations which are not completed within the time permitted.
- (2) The reasons put forward for withdrawal or unexcused absence shall be given and substantiated to the Board of Examiners. In case of illness of the candidate or a child which is mainly being taken care of by the candidate, a medical certificate is required. In case of illness of the candidate, the medical certificate must attest the inability of the candidate to take the exam. If a candidate withdraws from an examination that has already been taken, the medical certificate must state that the impact on the performance of the candidate due to medical reasons was not apparent and that there was no reasonable cause for doubting the ability of the candidate to take the examination. If the Board of Examiners considers that there are sufficient real indications that it was probable that the candidate was able to take the examination, the board may demand a medical certificate from a medical officer from the Technischen Universität Dortmund.

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The candidate will be given written notice should the Board of Examiners not accept the reasons put forward for withdrawal or non-attendance.

- (3) If a candidate attempts to influence their examination performance by deception (e.g. using non-authorized aids, using text passages without marking them as a quote, by copying from other examinees, etc.) the examination is to be graded as “insufficient” (5.0) or “failed”. This also takes place if an attempt at deception was made. The respective examiner decides if deception or an attempt at deception has taken place. If an attempt at deception or deception according to paragraph 1 is discovered during an examination by the supervisory staff, they shall record this attempt at deception or deception. The examiner present will then decide if the examination is to be graded as “insufficient” (5.0) or “failed”. A candidate trying to disturb the correct procedure of the examination may, after admonition, be disqualified from continuing the examination by the examiner or supervisory staff. In this case the respective examination is to be graded as “insufficient” (5.0) or “failed”. The respective reasons for the decision shall be put on record. In serious cases of deception or disturbance, the Board of Examiners may disqualify the candidate from taking further examinations.
- (4) The Board of Examiners may demand a written statement from the candidate when taking a module examination or a partial performance that he or she has composed the document – or, in case of teamwork, an accordingly marked part of the document – independently without having used any other sources and aids other than those indicated in the text and that literal and analogous citations have been marked. Article 16, paragraph 7 remains unaffected.
- (5) The candidate may demand within a period of two weeks that decisions made according to paragraph 3 shall be reviewed by the Board of Examiners. The candidate shall be immediately informed about negative decisions in writing. They shall be substantiated and must include information on legal remedies. The candidate shall be given the opportunity for a hearing before a decision is made.

## II. Master’s examination

### § 14

#### Admission to the Master’s examination

- (1) Students enrolled in the Master’s programme of Manufacturing Technology at Technischen Universität Dortmund or visiting students according to article 52 paragraph 2 Hochschulgesetz Nordrhein-Westfalen are admitted to examinations in this programme unless the admission is refused according to paragraph 2.
- (2) Admission shall be refused if
  - a. the candidate definitively fails an examination in the Master’s programme of Manufacturing Technology at Technische Universität Dortmund required according to these examination regulations, or definitively fails an examination in a closely related course of studies.
  - b. the candidate has taken an examination in one of the aforementioned courses of studies and a definitive and legally binding judgement regarding the student’s status of finally having failed has not yet been made due to a subsequent contestation of the board of examiner’s decision.

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- c. the candidate has forfeited his or her right according to article 9 paragraph 5 to an examination in the Master's programme of Manufacturing Technology at Technischen Universität Dortmund required according to these examination regulations.

## **§ 15**

### **Scope of the Master's examination**

- (1) The Master's examination is composed of examinations during the course of study for which 90 credit points must be acquired. A further 30 credit points must be acquired by the Master's thesis.
- (2) (2) The modules to be studied as well as the credit points and examination forms assigned to them may be found in the appendix, as well as which modules are compulsory and which elective. More information may be found in the module descriptions of the module manual.

## **§ 16**

### **Evaluation of examination performances during the course of study, acquiring credit points, grading**

- (1) The grades for examinations and partial performances are determined by the respective examiners. The following grading system shall be applied:

1 = very good	=	An excellent performance
2 = good	=	A performance which is considerably above average
3 = satisfactory	=	A performance which corresponds to average requirements
4 = sufficient	=	A performance which, despite its deficiencies, still meets the requirements
5 = insufficient	=	A performance which does not meet the requirements due to its considerable deficiencies

For a more differentiated assessment of examinations during the course of study the grades can be reduced or raised by 0.3: grades 0.7, 4.3, 4.7 and 5.3 are however excluded.

- (2) The number of credit points assigned to each module can be acquired when the module has been graded as at least "sufficient" (4.0) or rated as a "pass".
- (3) A written test, exclusively carried out as multiple choice, is rated as passed if:
  - a) 60 % of the total score has been achieved; or
  - b) the score achieved does not fall short of the average examination performance by more than 22% of the candidates who took the exam.

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(4) If the candidate has achieved the minimum score according to paragraph 3 and therefore passed the examination, the grade is as follows:

1 = “very good” if he or she has achieved at least 75 % more than the minimum score required.

2 = “good” if he or she has achieved at least more than 50 % but less than 75 % of the minimum score required.

3 = “satisfactory” if he or she has achieved at least more than 25 % but less than 50 % of the minimum score required.

4 = “sufficient” if he or she has achieved at least or up to 25 % of the minimum score required.

(5) If a written test was only partially carried out as multiple choice, the tasks carried out as multiple choice shall be graded according to paragraphs 3 and 4. The remaining tasks shall be graded according to the usual method. The grade for the examination performance shall be determined from both evaluations, whereby the proportion of the respective total score that must be achieved shall be taken into account. Paragraph 6 shall apply correspondingly.

(6) If the module has been completed by a module examination, the grade corresponds to the module grade. In the case of partial performances the module grade is generated by the arithmetic average of the non-rounded grades for partial performances completed in the module, with the individual grades of the partial performances being weighted with the respective number of credit points.

For the Modules 11: “Laboratory Work”, 12: “Scientific Project Work”, 13: “Interdisciplinary Qualifications” and 20: “Topics in Manufacturing Technology”, the total number of credit points of the individual partial performances may be higher than the number of credit points stated in the appendix and in the module description of the module manual.

In this case, the module grade will be calculated as mentioned above by using the weighted arithmetic average of the partial performances. When calculating the final grade, the module will be weighted with the credit points stated in the appendix.

The student may apply to have up to three voluntary student performances held during the semesters taken into account when the module grade is determined if the module examination or the partial performance was passed by a grade of at least “sufficient”.

The module grade is calculated from at least 75 % of the grade of the module examination or from the arithmetic average of the partial performances and from up to 25 % of the arithmetic average of the grades of up to three voluntary student performances.

The module grades in words are as follows:

with an average of up to 1.5	= very good
with an average of 1.5 to 2.5	= good
with an average of 2.5 to 3.5	= satisfactory
with an average of 3.5 to 4.0	= sufficient
with an average of above 4.0	= insufficient

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When forming module grades only the first decimal place behind the decimal point is taken into consideration; all other places are cancelled without rounding.

- (7) The overall grade of the Master's examination is calculated from the arithmetic average of the module grades generated according to paragraph 6 and the grade of the Master's thesis, whereby the individual module grades and the grade of the Master's thesis are weighted with the respective number of credit points. If more elective modules have been completed than required in the respective overview in the appendix, the modules with the worst grades are not to be taken into consideration for the Master's examination considering the minimum requirements defined in these examination regulations. If the same grades are awarded, the modules completed last are not to be taken into account. Another consideration is possible at the request of the candidate. Paragraph 6 applies accordingly.
- (8) The overall grade shall at the same time be indicated in the form of a grade corresponding to the European Credit Transfer System (ECTS). Moreover, ECTS grades may be issued for all graded examination performances. The Board of Examiners must decide appropriately on this matter.

The ECTS grades are stated as follows (percentages are approximate).

A = usually the best 10 % of students;  
B = usually the next 25 % of students;  
C = usually the next 30 % of students;  
D = usually the next 25 % of students;  
E = usually the next 10 % of students.

- (9) ECTS grades are principally formed on the basis of a comparison of the cohorts of the last six semesters. Should this group be smaller than 50 persons, the reference group shall be determined from the last ten semesters. Strictly speaking, the current semester shall not be considered when forming the ECTS grades. When no statistical data for the calculation of a relative assessment is available, no ECTS grades shall be issued. For legal reasons, the Board of Examiners may decide to refrain from issuing ECTS grades. Corresponding information shall be published in the final document. When composing the reference group, distinctions must be made between the degree and degree course. Furthermore, the composition of the reference group may be altered in well-founded cases. The Board of Examiners must decide appropriately on this matter.
- (10) The overall evaluation "Pass with distinction" shall be awarded instead of the overall grade "very good" when the Master's thesis is graded with at least 1.3 and the weighted average of the credit points for all other grades in the module is smaller than 1.3.

## **§ 17 Master's thesis**

- (1) Students may start preparing their Master's thesis after having acquired 80 credit points. 30 credit points may be acquired through the Master's thesis.
- (2) The Master's thesis shall demonstrate that the candidate is able to solve a problem independently and within a given period by using scientific methods. The candidate may make proposals as to the topic of the thesis. The topic of the Master's thesis should be industry-related and must contain the specialist field of manufacturing technology. The

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topic is assigned by the Chairman of the Board of Examiners; the exact date of assigning the topic shall be recorded.

- (3) The Master's thesis can be assigned and supervised by any professor and any habilitated lecturer of the subject who works in research and teaching. Other scientists complying with the requirements according to article 65 paragraph 1 Hochschulgesetz Nordrhein-Westfalen may be appointed as supervisors with the approval of the Board of Examiners.
- (4) In the case that the candidate cannot name a supervisor, the Chairman of the Board of Examiners will provide the student with a topic and a supervisor for their Master's thesis.
- (5) A completion period of six months is set for the Master's thesis. The topic and the assignment must be so designed that the thesis can be completed within this period of time. Upon substantiated application of the candidate, the Chairman of the Board of Examiners may exceptionally grant an extension of up to four weeks in consultation with the supervisor. An application for extension must be filed at the latest two weeks before the completion period ends.
- (6) The topic of the Master's thesis may only be returned once and within the first two weeks; the Master's thesis is then not considered to have been commenced.
- (7) The Master's thesis shall not exceed 120 pages and shall be written in the English language.
- (8) The Master's thesis must be completed as a piece of individual work. This however does not exclude the topic of the Master's thesis being dealt with within a group. In this case, it must be ensured that the contribution to be evaluated as an examination performance is clearly distinguishable and assessable by objective criteria and fulfils the requirements of paragraph 1.
- (9) When submitting the Master's thesis, the candidate must affirm that he or she has written the thesis independently without having used any sources or aids other than those indicated in the text and that literal and analogous citations have been marked. Unpublished articles must also be included in the source list. A standard printed form issued by the central examination office of the Technischen Universität Dortmund needs to be used for the statutory declaration and submitted, duly signed, as an inherent part of the Master's thesis.
- (10) The Master's thesis incorporates an oral examination in which the performed work and the obtained results are presented. It marks the final date of the Master's examination and must be carried out after the Master's thesis has been submitted. Generally, 30 to 45 minutes are provided for the oral examination per candidate. The oral examination is evaluated by two examiners, who are in general identical to the examiners of the Master's thesis. The oral examination is to be evaluated according to article 8, paragraph 8 clauses 3 and 4.

## **§ 18**

### **Acceptance and evaluation of the Master's thesis**

- (1) The Master's thesis shall be submitted to the office of the Dean of the Faculty of Engineering in duplicate and additionally in electronic form which is compatible with plagiarism-detection software within the time stipulated. The date of submission shall be recorded. When posting the documents, the date of the postmark shall be valid. If the Master's thesis is not submitted by the due date, it shall be graded as "insufficient" (5.0).
- (2) The Master's thesis shall be reviewed and rated by two examiners. One of the examiners shall be the supervisor of the thesis (the first assessor). The second examiner (the second assessor) shall be appointed by the Chairman of the Board of Examiners.
- (3) The individual grading is to be undertaken according to article 16 and must be justified in writing. The grade of the Master's thesis is formed from the arithmetic average of the individual grades provided that the difference does not exceed 2.0. In the case the difference exceeds 2.0 or if one examiner grades the Master's thesis with "sufficient" (4.0), the Board of Examiners shall appoint a third examiner to grade the Master's thesis. In this case the grade shall be generated by the arithmetic average of the two best grades. However, the Master's thesis can only be graded as "sufficient" (4.0) or better when at least two grades are "sufficient" (4.0) or better. Article 16 paragraph 6 is valid accordingly.
- (4) The candidate shall be informed about the evaluation of the Master's thesis one month after submission at the latest.
- (5) The total grade of the Master's thesis is established from the average grade of the assessment, weighted with 0.8, and the grade of the oral examination, weighted by 0.2.

## **§ 19**

### **Additional qualifications**

- (1) The candidate may take additional examinations other than in the modules required as long as the candidate has neither passed nor definitively failed the Master's exam. No credit points can be acquired from these examination performances.
- (2) Upon application by the candidate, the results of the examinations in the additional subjects are indicated in the transcript of records. They are not however included when determining the overall grade.



## **§ 20**

### **Diploma, certificates for changing universities**

- (1) The candidate shall usually receive a diploma certifying that he or she has passed the Master's examination no later than four weeks after the last examination performance has been rated. The diploma dates from the day the last examination was taken. The diploma includes the overall grade of the Master's examination as well as the ECTS grade according to article 16 paragraph 8, the topic and the grade of the Master's thesis, the modules and the module grades as well as the number of credit points earned in each module.
- (2) A diploma supplement is added to the diploma. It describes, in particular, the significant course content on which the degree was based, the curriculum, the expertise gained with the degree and the awarding university. The diploma supplement shall be issued in German and in English. Furthermore, an overview of the examination performances accomplished will be attached to the diploma (Transcript of Records).
- (3) On the request of the candidate, additional performances can be identified on the Transcript of Records which were not included in the module grade and overall grade.
- (4) On request of the candidate, a certificate of the previously achieved examination performances can be issued (attestation of grades, *Notenbescheinigung*) before the Master's examination has been completed. The certificate shall contain a listing of the successfully completed modules with the credit points acquired, the examination performances and the grades according to article 16 paragraph 1. This certificate may only be issued once per semester.
- (5) The diploma is to be signed by the Chairman of the Board of Examiners.
- (6) The diploma and the certificates are also issued to the candidate in English.

## **§ 21**

### **Master's degree certificate**

- (1) The candidate receives a Master's certificate with the date of the diploma in German and in English. It certifies the conferment of the academic degree according to article 4. The course of studies of the graduate shall be included in the Master's certificate.
- (2) The Master's certificate is signed by the Dean of the Faculty of Engineering and the Chairman of the Board of Examiners and provided with the seal of the Faculty of Engineering.

### III. Final provisions

#### § 22

##### **Invalidity of the examination and deprivation of the Master's degree**

- (1) If the candidate has cheated in an examination and if this fact does not become known until after the diploma has been delivered, the Board of Examiners may subsequently amend the grades appropriately for those examinations performances in which the candidate cheated and may declare the examination as entirely or partially failed.
- (2) If the conditions for admission to an examination were not fulfilled without the candidate intending to cheat in this matter, and if this fact does not become known until after the diploma has been delivered, this deficiency is resolved by the candidate passing the exam. If a candidate has deliberately obtained admission by unjust means the Board of Examiners shall decide on the legal consequences with respect to Administrative Procedures Act for the Land North Rhine-Westphalia (Verwaltungsverfahrensgesetzes für das Land Nordrhein-Westfalen).
- (3) Before a decision is taken according to paragraph 1 or 2 the candidate concerned shall be given the opportunity to comment on the incident in oral or written form.
- (4) If a decision is taken according to paragraph 1 or paragraph 2 clause 2 the incorrect diploma shall be revoked and, where appropriate, a new diploma shall be issued. A decision taken according to paragraph 1 or paragraph 2 clause 2 is excluded after a period of five years after having issued the diploma.
- (5) The Master's degree is annulled and the Master's degree certificate shall be revoked if it should later be found that it has been obtained by deception or if the basic requirements for its conferment have been assumed by mistake. The Faculty Board of the Faculty of Engineering shall decide on the deprivation.

#### § 23

##### **Access to examination documents**

- (1) After the result of an examination has been announced, students are allowed to inspect their written test(s). The time and place of the inspection is determined by the examiners and shall be announced in an appropriate form at the latest once the results of the examinations have been announced.
- (2) Upon request, students may also be allowed inspection of further written examination performances, related reports by the examiners as well as the minutes of oral examinations. The application must be made within three months after the examination results have been announced to the Chairman of the Board of Examiners. The Chairman shall determine the place and the time of the inspection.

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## § 24

### Scope, effective date and publication

- (1) These examination regulations shall apply to all students who first enrolled in the Master's course of Manufacturing Technology at the Technischen Universität Dortmund since the winter semester 2015/2016.
- (2) Articles 7, 8 paragraph 3, paragraph 5, paragraph 9 clause 7 and paragraph 10, 9 paragraph 4 and paragraph 6, 13 paragraph 2, 16 paragraphs 3 to 5, paragraph 6 clauses 6 and 7 as well as paragraph 10, 20 paragraph 2 and 21 paragraph 1 shall apply for all students who are enrolled in the Master's course of Manufacturing Technology at Technischen Universität Dortmund.
- (3) Students who, when these examination regulations came into force, were already enrolled in the Master's programme before the winter semester 2015/2016 may apply to the Board of Examiners to be examined according to these examination regulations. The application is irrevocable. Unsuccessful attempts and performances will be accredited.
- (4) These examination regulations are published in the official gazette of Technischen Universität Dortmund and shall come into force on 1st October 2015.

Issued on the basis of the resolutions adopted by the Faculty Board of the Faculty of Engineering from 20.01.2016 and the Rector's Board of Technischen Universität Dortmund from 18.01.2016.

Dortmund, 26<sup>th</sup> January 2016

The Rector

of Technischen Universität Dortmund

Professor

Dr. Dr. h.c. Ursula Gather