

**Examination regulations  
for the Master's degree courses  
in Chemical Engineering and Biochemical Engineering  
at the Faculty of Biochemical and Chemical Engineering  
of the Technische Universität Dortmund  
dated of March, 16, 2016**

According to § 2 paragraph 4 in connection with § 64 paragraph 1 of the Law of institutions of higher education in the federal state of North Rhine–Westphalia [Hochschulgesetz–HG – Higher Education Act] dated of September 16<sup>th</sup> 2014 (GV. NRW p. 547), the Technische Universität Dortmund has issued the following regulations:

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## I. General Information

### § 1

#### **Validity of the Master's degree examination regulations**

- (1) The Master's degree examination regulations shall apply to the Master's degree programme in chemical or biochemical engineering at the Faculty of Biochemical and Chemical Engineering of the Technische Universität Dortmund. They will follow the structures of the Master's degree studies according to § 64 paragraph 1 of the law of institutions of higher education in the federal state of North Rhine-Westphalia [HG – Hochschulgesetz NRW – Higher Education Act].
- (2) The module descriptions in the module handbook show the different programme details, teaching contents, and competences to be acquired. They do not form part of these regulations. They shall be determined by the competent Faculty Councils and must be indicated to the Rectorate.

### § 2

#### **Purpose of Study**

The Master's degree programme prepares students for scientific work. When the student successfully completes the Master's degree programme another professional qualifying degree will be awarded. By successfully completing their Master's degree the candidates give proof of their professional competence and have access to the following professional branches:

- Scientific professions in industry, administration and research institutes
- Research work with a view to taking a doctoral degree
- Change to another university in Germany or abroad for further scientific research

### § 3

#### **Entry Requirements**

Candidates who fulfil the requirements of the admission regulations for the Master's degree courses in Chemical and Biochemical Engineering at the Faculty of Biochemical and Chemical Engineering of the Technische Universität Dortmund shall be admitted to

the Master's degree programme in chemical engineering and biochemical engineering.

#### **§ 4**

##### **Master's Degree**

After the successful completion of the Master's examination the faculty shall confer the academic degree Master of Science (M. Sc.) for Chemical Engineering or Biochemical Engineering.

#### **§ 5**

##### **Credit point system**

- (1) The programme is based on a credit point system which is compatible with the European Credit Transfer System (ECTS).
- (2) To each module depending on its study attainment a specific number of credit points is attributed. Within the meaning of these examination regulations one credit point shall be awarded for a study achievement which represents a workload of approximately 30 hours. As a rule students must obtain 30 credit points per semester.
- (3) Credit points are normally awarded on the basis of successfully completed modules.

#### **§ 6**

##### **Standard period of studies and range of studies**

- (1) The standard period of Master's degree studies is three semesters (one year and a half) and includes the completion of the Master's thesis.
- (2) The Master's degree programme includes a total of 90 credits or 2700 working hours, which are divided among compulsory subjects, compulsory electives and free electives.
- (3) Students who have chosen the branch of study "Process Systems Engineering" in the Master's programme of Chemical Engineering must bring proof that they have taken a module "Group project" as a term assignment including a presentation in the Bachelor's studies. If a module "Group project" as a term assignment with a presentation representing an extent of 10 credit points has not been completed in the Bachelor's studies such a module must be completed successfully as an

additional compulsory module in the Master's programme. The extent of free electives is then reduced correspondingly by 10 credit points.

- (4) The programme is divided into modules that have to be completed within maximum two semesters. These modules consist of related courses, self standing in contents and time, which normally represent an extent of 5 credit points. The recommended scheduling of the different subjects of the Master's programme can be found in the appendix 2.
- (5) The compulsory modules and compulsory electives of the Master's programme are listed in the appendix 1. The free electives shall be shown in the module descriptions of the module handbook and posted through announcements displayed on a board.
- (6) The courses of the compulsory electives and free electives can also be offered in English. In the branch of study 'Process Systems Engineering' courses in English can also be offered in compulsory subjects.
- (7) The Master's programme optionally starts in the summer or winter semester. For students who have completed a Bachelor's programme of six semesters at another university or who have chosen the branch of study "Process Systems Engineering" in the Master's programme of Chemical Engineering, the Master's degree programme will additionally comprise a pre-semester. The studies shall consist of the three-semester Master's programme at the Faculty of Biochemical and Chemical Engineering and additional requirements amounting to 30 credit points (pre-semester). Further particulars will be regulated by the admission regulations for the Master's programme in Biochemical and Chemical Engineering.

## **§ 7**

### **Examinations and compensation for a permanent physical injury or disability**

- (1) The modules, as a rule, shall only be completed by an examination. As a rule the examinations shall be taken after the student has completed all the courses in a module (module examination). Individual requirements can also be fulfilled in a cumulative way to complete a module. The individual requirements shall be fulfilled in the framework of individual courses. The respective forms of examinations (module examination or individual requirements / marked or not marked by a grade) are shown in the appendix 1. Module examinations or individual requirements that are completed in the two first semesters can be taken without being marked.

- (2) Modules, which were part of a Bachelor's examination in a comparable form, can't be part of a Master's examination except for additional qualifications that were completed in the Bachelor's programme.
- (3) Examinations for the courses that are taught in English can be taken either in German or in English depending on the students' individual choice.
- (4) The module examinations and individual requirements shall be integrated into the course and consist of written examinations, papers or seminar arrangements, term assignments, oral examinations or presentations with or without discussion and specific practical examinations. The responsible tutors, with the consent of the examination board, can chose to determine other appropriate forms of examinations.
- (5) The nature, form and extent of the module examinations and individual requirements are shown in the tables of the appendix 1 or the module descriptions of the module handbook or will be announced by the examiners at the latest two weeks after the beginning of the course. Individual requirements, which were part of a Bachelor's examination in a comparable form, can't be part of a Master's examination.
- (6) The responsible tutors / examiners shall announce the examination dates promptly at the beginning of the courses. The registration procedures and terms for module examinations and individual requirements shall be determined by the examination board. The students must legally register for the examinations one week prior to the examination date. A deregistration without giving reasons shall be allowed for oral examinations up to one week prior to the respective examination date, and up to one day prior to the respective examination for written examinations. The student shall be considered as not registered for the examination in this case. Further details concerning registration for the examinations shall be announced by the responsible tutors at the beginning of the courses.
- (7) The initial registration for the module examinations after the first and second semester shall be made at the latest by the end of the semester during which the course was attended to which the examination is attributed according to the (shown in appendix 2) and the module descriptions of the module handbook. If the registration is not made within the next four semesters the right to take the examination shall expire unless the candidate can prove that he or she is not responsible for the failure to meet the time limit. If the provisions of § 64 paragraph 3a of the Higher Education Act apply the delay shall be extended by the periods described there.

- (8) The written examinations of the module examinations shall last a minimum of two and a maximum of four hours, and the oral examinations' time from 15 to a maximum of 45 minutes per student. For individual requirements the written examinations shall cover a minimum time of one and a maximum of three hours, the oral examinations a minimum of 15 and a maximum of 30 minutes per student. For an oral group examination the overall time must not exceed 90 minutes for module examinations and 60 minutes for individual requirements.
- (9) The written examinations shall be written under ward and are not public. Tools that may be allowed shall be announced in due time by the respective tutors prior to the examination.
- (10) The written examinations may be written completely or partly as a multiple choice test. In written examinations where multiple choice tests are taken and where two examiners shall evaluate according to paragraph 11 the examination tasks shall be elaborated jointly by both. This shall not be necessary, however, when two examiners assure the final evaluation of the examination. Especially when using the form of multiple choice tests attention must be paid to assuring that the examination tasks take into account the contents taught in the modules or courses and the necessary knowledge to allow reliable examination results. When they elaborate the examination tasks they must determine which answers shall be recognised as correct.
- (11) Written examinations shall normally be evaluated by two examiners. If the written or oral examination is the last possible attempt at retaking or if a programme shall be completed by an examination the results always have to be evaluated by two examiners (§ 65 paragraph 2 HG) [Hochschulgesetz: Higher Education Act]. In addition, oral examinations will always be held in front of several examiners or one examiner and one expert assessor as individual or group examinations. The results of the written examinations shall be announced to the students at the latest six weeks after the test. In that process the requirements for data protection shall be respected. According to § 15 paragraph 1, if an oral examination is taken before only one examiner the examiner shall hear the assessor's opinion before he fixes the grade. If an oral examination is taken before two examiners each examiner fixes an individual grade for the oral examination achievement according to § 15 paragraph 1. The grade for the oral examination achievements is calculated from the arithmetic average of the two individual grades according to § 15 paragraph 8.
- (12) The essential points and results of the oral examination shall be recorded in a protocol. The result of the examination shall be announced to the students right after the oral examination. Students who want to take the same examination at a

later date shall be admitted as auditors provided there is enough room and the examined student does not object. The admittance is not inclusive of the discussion that follows and the announcement of the examination grade. If such persons influence or disturb the course of the examination they can be excluded by the examiner as auditors.

- (13) In modules that are completed with a module examination, students may be asked to perform additional work during the different courses. This may consist of papers, term assignments, practical work, practical exercises, written or oral tests, lectures and protocols or portfolios. Concerning form and contents the requirements of the additional study work remain well below the requirements of an examination or individual requirement. If this additional work is not defined in the module descriptions, the tutors shall announce it at the beginning of the course. The study work can be marked by a grade or evaluated as “pass”/“fail”. § 15 paragraph 4 letter b does not apply. Participation in the additional study work may also be declared as optional. To be admitted to the module examinations, the student must have completed all the assignments required for the module and not optionally performed.
- (14) For excursions, language courses, practical work, practical exercises or comparable courses that require an active participation of the students to achieve the specific learning objectives, attendance may be mandatory. The responsible tutors, with the consent of the examination board, shall determine the attendance according to the principle of proportionality. In this context, on a case-by-case basis and with due observance of the specific requirements of each course it has to be weighed specifically and determined whether and to what extent the compulsory attendance is required for the achievement of a learning objective and whether the learning objective can be achieved by less restrictive means, as by way of self-study by oneself or in private study groups. With regard to constitutional requirements, an intrusion into study freedom is legitimised only to this very limited degree. That also means that a general decision, isolated from the individual case, is inadmissible at all times. The exact rules of a mandatory attendance will be announced to the students at the beginning of the course in an appropriate form.
- (15) If a student credibly proves by means of a medical certificate that he/she is not able to write an examination completely or partly in the required manner or period because of a long and permanent or constant handicap or a chronic disease, the chairman of the examination board may allow the student to take an equivalent examination in another form or length of time. If there are doubts, the competent person or office for questions concerning handicapped students of the Technische Universität Dortmund (e. g. the office “Behinderung und Studium” [Office for



Handicap and Studies]) within the centre of Higher Studies (Zentrum für Hochschulbildung) at the Technische Universität Dortmund) shall be involved. The examination procedure shall consider legal maternity periods and downtimes due to care for residing children who have to be looked after most of the time, for the wife/the husband, the registered life partner, or persons to who the student is related in straight line of descent or a relative in the first degree, as far as those need long-term care.

## **§ 8**

### **Repetition of examinations, passing the Master's examination, definitive failure of the examination**

- (1) The module examinations and different individual requirements can be repeated twice, if they are not passed or are not considered as passed. If an individual requirement is not passed only this has to be repeated. Passed examinations cannot be repeated. The definitive failure of an examination in compulsory electives and free electives can be replaced by successfully completing other compulsory electives and free electives.
- (2) The repetition of a module examination or an individual requirement must be completed within two semesters after a (failed) first attempt, otherwise the student shall lose the right to take the examination unless he or she can prove that they are not responsible for the failure to meet the time limit. If the conditions of § 64 paragraph 3a of the Higher Education Act are met, then the deadline shall be extended by the specified periods.
- (3) Deviating from paragraph 1, the Master's thesis can only be repeated as a whole and then only once. The rejection of the subject of a Master's thesis is only admissible according to § 16 paragraph 8 provided the candidate did not earlier reject a subject while he or she prepared the Master's thesis that was not successful.
- (4) The Master's examination shall be passed when all 90 credits from the required module examinations or individual requirements, the laboratory courses and the Master's thesis were acquired.
- (5) The Master's examination shall be regarded as definitely failed if
  1. the Master's thesis after repetition is again not passed or is not considered as passed
  2. The candidate cannot acquire the necessary minimum number of credit points in one or several of the modules.

3. One of the compulsory modules listed in the annex was definitely failed.
- (6) If the Master's examination is definitely failed or an examination is regarded as definitely failed the chairman of the examination board will give the candidate a written notification. The notification shall be provided with a plea instruction. On request the candidate shall be issued a certificate concerning the successfully passed examinations; a supplement is added that this certificate does not apply for a presentation at another university.

## § 9

### Examination board

- (1) The Faculty of Biochemical and Chemical Engineering shall establish an examination board which be in charge of the organization of the examinations and the tasks assigned by these examination regulations.
- (2) An examination board in accordance with paragraph 1 consists of seven members: four members of the group of professors, one member of the group of the scientific assistants, and two members of the group of students. The members are separately elected by the Faculty Council according to the groups for two years, the members of the students' group for one year. The Faculty Council elects the members of the examination board with exception of the chairman and his/her vice chairman.
- (3) The examination board elects the chairman and the vice chairman from its members of the group of professors. Re-election is admissible.
- (4) The examination board shall make sure that the provisions of the examination regulations are maintained and shall provide for the proper administration of the examinations. It is especially responsible for the arbitration of objections made against decisions that were taken during the examination procedure and for the resolution of questions and problems that concern all the faculties. In addition, the examination board has to report regularly to the faculty, at least once a year, on the development of the examinations and study periods. It submits suggestions for the reform of the examination regulations, study regulations and study plans. The examination board can assign the completion of specific tasks during the current business (e. g. questions of recognition, urgent decisions etc.) to the chairman; this does not apply, however, to decisions regarding objections and to the report to the Faculty Council.
- (5) The examination board shall have a quorum if – besides the chairman or his/her representative and one additional professor – at least two additional members

entitled to vote are present. It shall decide with a simple majority. In case of a tie, the vote of the chairman shall decide. The student members of the examination board shall not participate in educational–scientific decisions, especially in the judgement, acknowledgement or apportionment of study and examination requirements, in the specification of the examination tasks and in the appointment of the examiners and assessors.

- (6) The members of the examination board shall have the right to attend the examinations.
- (7) The meetings of the examination board are not public. The members of the examination board, the examiners and the assessors shall be subject to confidentiality. Unless they are employed in the civil service, they must swear an oath of confidentiality to the chairman of the examination board.
- (8) To carry out its current administration tasks the examination board shall rely on the Central Examination Office of the Technische Universität Dortmund.

## **§ 10**

### **Examiners and Assessors**

- (1) The examination board shall appoint the examiners according to the legal provisions. The examination board can confer the appointment upon the chairman. All professors as well as additional persons entitled to give examinations within the provisions of § 65 paragraph 1 HG [Hochschulgesetz: Higher Education Act] can be appointed as examiners. A person is allowed to be appointed an assessor if he/she has passed the appropriate Diplom or Master's examination in the respective area of studies or if he/she can bring proof of a relevant qualification.
- (2) The examiners shall work independently.
- (3) The candidates may nominate an examiner for the Master's thesis. If possible, the nominations of the students shall be taken into consideration. However, the nominations of the students do not substantiate a claim.

## **§ 11**

### **Recognition of previous examination achievements, advancement into higher semesters**

The recognition of previous examination achievements and the advancement into higher semesters shall be determined by the respective valid regulations on the

recognition of previous achievements for all the Bachelor's and Master's degree courses at the Technische Universität Dortmund.

## § 12

### **Absence, Withdrawal, Fraud, and Violation of the Rules**

- (1) An examination result shall be deemed “not sufficient” (5.0) or “not passed” if the student does not appear for the examination without good reason or if he/she withdraws from the examination after it has started without good reason. This shall also apply if the written examination has not been completed within the allotted time.
- (2) The reasons for withdrawal or absence must be presented and substantiated to the examination board in writing without any delay. If the student or a child for whom the student is in charge most of the time is ill, he/she must submit a medical certificate in German. If the student is ill, the medical certificate must indicate the incapacity to take the examination. If a student, for health reasons, later withdraws from an examination that he or she has taken, the medical certificate must state that the impairment for the student at the time of the examination was indiscernible and that there were no reasonable grounds to doubt the capacity to take the examination. If the examination board sees sufficient factual indications which make it seem likely that the student was capable to take the examination, the examination board can ask for a medical certificate from a medical officer of the Technische Universität Dortmund. If the examination board is not prepared to accept the reasons for the withdrawal, the candidate shall be informed in writing.
- (3) If the student tries to affect the result of an examination by cheating (ex. using impermissible aids, adopting text passages without rendering them as quotations, cribbing etc.) the respective examination shall be deemed “not sufficient” (5.0) or “not passed”. The same applies to an attempted cheating. The decision of whether it is an act of cheating shall be made by the examiner. If an attempted cheating in the sense of sentence 1 is detected by the supervisor during an examination, he/she shall record the cheating or attempted cheating in a protocol. The examiner decides whether the examination shall be marked as “not sufficient” (5.0) or “not passed”. If a candidate disturbs the proper administration of the examination, he/she can be kept from completing the examination normally after dissuasion by the examiner or supervisor in charge. In this case, the appropriate examination result shall be deemed “not sufficient” (5.0) or “not passed”. The reasons for the decision shall be recorded in the student's file. In serious cases of

fraud and disturbance, the examination board can exclude the student from subsequent examinations.

- (4) The examination board can ask that the candidates – or in a group project the candidate's share of the work – make a written declaration, that the work was done independently and that no sources or aids were used other than those indicated and that quotations and paraphrases were properly indicated. § 16 paragraph 10 shall remain unaffected.
- (5) Within a period of 14 days the candidate can appeal the examination board's decision according to paragraph 3. The student shall be informed of incriminating decisions immediately and in writing. Such decisions shall be justified and provided with instructions on right to appeal. Prior to the decision the candidate shall be given the possibility of a fair hearing.

## **II. The Master's examination**

### **§ 13**

#### **Admission to the Master's examination**

- (1) Students enrolled at the corresponding Master's degree programme for Chemical Engineering or Biochemical Engineering at the Technische Universität Dortmund or as second priority student according to § 52 paragraph 2 HG (Hochschulgesetz – Higher Education Act] shall be deemed admitted to the Master's examination of this programme unless admission has to be refused according to paragraph 2.
- (2) Admission shall be refused if:
  1. according to these examination regulations the candidate definitely failed an examination in the Master's degree programme for Chemical Engineering or Biochemical Engineering at the Technische Universität Dortmund or in another programme which is significantly close in content to the relevant programme, or
  2. an examination has been taken in one of the aforementioned degree programmes but due to a contestation of the examination result an enforceable and legally binding decision concerning the definitive failure is not yet available, or
  3. according to these regulations the candidate has lost the right to take an examination which the Master's degree programme requires for Chemical Engineering or Biochemical Engineering at the Technische Universität Dortmund according to § 7 paragraph 7 or § 8 paragraph 2.

## § 14

### Master's examination

- (1) The Master's examination consists of required examinations in which a total of 60 credit points must be acquired. The distribution is shown in the appendix. Another 30 credit points must be acquired through the Master's thesis. For students who have successfully completed a six-semester Bachelor's degree programme at another university, the Master's examination shall comprise additional requirements in the order of 30 credit points which have to be acquired in the course of a pre-semester (§ 6 paragraph 7).
- (2) In the Master's degree programme "Chemical engineering" the programme "Process systems engineering" can be chosen. In the programme "Process systems engineering" all the compulsory courses, the "PSE Lab" and a sufficient number of free electives are offered in English. If this programme is chosen the Master's examination shall comprise additional requirements in the order of 30 credit points which have to be acquired in the course of a pre-semester. Further particulars will be regulated by the admission regulations for the Master's programme in Biochemical and Chemical Engineering.
- (3) The compulsory modules or compulsory electives, the respective forms of examination (module examination or individual requirements) and the corresponding credit points are shown in the appendix.

## § 15

### Evaluation of required examinations, acquisition of credit points, calculation of grades

- (1) The grades on the examinations and individual requirements shall be determined by the respective examiner. For the evaluation the following grades shall be used:

1 =	very good	=	excellent
2 =	good	=	an achievement that is considerably above the average requirements
3 =	satisfactory	=	an achievement that meets the average requirements
4 =	sufficient	=	an achievement that satisfies the requirements in spite of its defects
5 =	not sufficient	=	an achievement that does not satisfy the requirements because of significant defects

Interim grades can be calculated for the required examinations by decreasing or increasing the grades by 0.3; however, the grades 0.7, 4.3, 4.7 and 5.3 are excluded.

- (2) In consultation with the examination board, examination achievements which are not calculated in the overall grade can be evaluated either according to the grade scale as shown in paragraph 1 or according to the following simplified scale:

passed = an achievement that meets at least the requirements  
not passed = an achievement that does not satisfy the requirements because of significant defects

- (3) The number of credit points assigned to each module shall be acquired if the module was completed with a grade of at least “sufficient” (4.0), or “passed”.

- (4) A written examination which was completed exclusively according to the multiple choice procedure shall be considered as passed if

- a) 50% of the total number of points to be achieved were reached or
- b) the number of points achieved is not more than 22% less than the average examination result of the candidates who participated in the examination

- (5) If the candidate reached according to paragraph 4 the minimum number of points and thus passed the examination the grades are as follows:

1 = *very good*, if he or she achieved at least 75%

2 = *good*, if he or she achieved at least 50% but less than 75%

3 = *satisfactory*, if he or she achieved at least 25% but less than 50%

4 = *sufficient*, if he or she achieved no or less than 25%

of the points to be achieved above the minimum number of points.

- (6) If a written examination was completed only partly according to the multiple choice procedure the tasks completed according to the multiple choice procedure shall be evaluated as shown in the paragraphs 4 and 5. The remaining tasks shall be evaluated according to the procedures that normally apply to them. Both evaluations shall determine the grade of the written examination whereby the proportions of the respective total number of points to be achieved shall be taken into account. Paragraph 8 applies accordingly.

- (7) The paragraphs 4 to 6 don't apply if the evaluation of the written examination is assured by examiners within the meaning of § 10.

- (8) If the module is completed with a module examination the grade on the

examination is the grade for the module. For individual requirements the module grade shall be calculated from the arithmetic average of the non-rounded grades of the individual requirements in the various modules whereby the grades of the individual requirements shall be weighted according to the number of corresponding credit points. In addition, upon request of the students optional term-accompanying study requirements may be considered in the fixing of the module grade provided the module examination or individual requirements were passed with at least sufficient results. The module grade shall then be calculated to at least 75% from the grade achieved in the module examination respectively the arithmetic average of the individual requirements and up to 25% from the arithmetic average of the grades of the maximum three optional term-accompanying study requirements.

The module grades are as follows in words:

an average of up to 1.5	= very good
an average of over 1.5 up to 2.5	= good
an average of over 2.5 up to 3.5	= satisfactory
an average of over 3.5 up to 4.0	= sufficient
an average of over 4.0	= not sufficient

Only the first decimal place after the comma shall be taken into consideration when calculating the module grade. All subsequent decimal places will be cancelled without rounding.

- (9) If more compulsory electives or free electives are completed than required in the corresponding table of the appendix the modules with the worst grades shall not be considered for the Master's examination in compliance with the minimum requirements determined in these examination regulations. In the same notes later completed modules are not to be considered. At the candidate's request another consideration is possible.
- (10) In addition, if the total number of credit points of the compulsory electives or free electives can't be reduced to the total number required by these regulations, the weighted module grades of the compulsory elective or free elective, determined in accordance with paragraph 8, shall be standardised by dividing their total number through the actual number of credit points of the compulsory or free electives and by multiplying them with the total of credit points for the compulsory or free electives according to these regulations. No decimal place shall be cancelled for the calculation of the overall grade when the grade of the compulsory electives or



free electives is calculated this way.

(11) The overall grade for the Master's examination shall be calculated from the arithmetic average of the grades of the compulsory electives or free electives determined in accordance with paragraph 10 and the module grades determined in accordance with paragraph 8 (including the Master's thesis), so that the individual module grade shall be weighted according to the number of credit points belonging to the module. Paragraph 8 applies accordingly. Paragraph 8 applies correspondingly. If a pre-semester must be completed according to § 6 paragraph 7 the requirements of the pre-semester shall be considered in the order of 30 credit points for the overall grade of the Master's examination.

(12) The final grade shall also be reported in form of a grade corresponding to the grading system of the European Credit Transfer System (ECTS). In addition to this ECTS grades may be reported for all assessed examination requirements. However, this requires a corresponding decision to be taken by the examination board. The grades corresponding to the ECTS system shall be reported as follows:

A = usually the best approx. 10% of all successful students;

B = usually the next approx. 25% of all successful students;

C = usually the next approx. 30% of all successful students;

D = usually the next approx. 25% of all successful students;

E = usually the next approx. 10% of all successful students;

(13) The ECTS grade is generally calculated by comparing the results of the cohorts over the last six terms. If this group is smaller than 50 persons a reference group from the last 10 terms must be determined. The current term shall generally not be taken into consideration. As long as no statistical data is available to complete a relative evaluation, no ECTS grades are reported. To assure legally binding grades the examination board may decide not to report ECTS grades. Appropriate information shall be provided in the final document. Regarding the composition of the comparison group distinctions shall be made depending on the degree and the study programme. In addition, if objectively justified, a different composition of the comparison group may be allowed. However, this requires a corresponding decision to be taken by the examination board.

- (1) The Master's thesis should show that within a stipulated time the candidate is able to address a problem of a subject relating to his or her field of study independently and according to scientific methods. The subject of the thesis shall be assigned by the chairman of the examination board. The date of this assignment shall be recorded.
- (2) The Master's thesis is assigned upon request by the candidate. The Master's thesis can be started after the acquisition of 53 credit points. In his or her request for the assignment, the candidate must show that these conditions are fulfilled. By writing the Master's thesis students acquire 30 credits.
- (3) According to a mutual agreement between the examiner and the student, the Master's thesis can be written either in German or in English.
- (4) The Master's thesis can be assigned and supervised by any professor or any specialized senior scholar of the Faculty of Biochemical and Chemical Engineering. If the Master's thesis is completed in an institution outside of the Faculty of Biochemical and Chemical Engineering a professor of the Faculty of Biochemical and Chemical Engineering working in research and teaching must assure the supervision and evaluation as first supervisors. The students shall be given the chance to make suggestions for the subject of the Master's thesis and the supervisors. Other scientists meeting the requirements according to § 65 paragraph 1 HG Hochschulgesetz - Higher Education Act] can be appointed as supervisors upon approval of the examination board.
- (5) If a candidate cannot appoint a supervisor, the chairman of the examination board shall ensure that the candidate receives a subject and supervisor for the Master's thesis.
- (6) The Master's thesis must generally be completed as an individual work. But this does not exclude that a work group works together on the subject of the Master's thesis. However, it must be assured that the contribution being evaluated as an examination requirement by the single candidate is clearly distinguishable and appraisable and indicates a clear restriction based on specification of objective criteria and that it fulfils the requirements according to paragraph 1.
- (7) Preparation time for the Master's thesis is 26 weeks. The subject and tasks of the Master's thesis shall be limited by the supervisor in order to make sure that the deadline for preparing the Master's thesis can be adhered to. In individual cases upon request if justified by the candidate, the chairman of the examination board in accordance with the supervisor can lengthen the preparation time up to four weeks. The application for an extension must be made to the examination board at least 14 days prior to the expiration of the preparation time.

- (8) The subject of the Master's thesis can be rejected only once and only within the first month of the preparation; at that point the Master's thesis shall be considered as not started.
- (9) The length of the Master's thesis shall not exceed approx. 80 pages.
- (10) When submitting the Master's thesis, the candidate must swear on oath that he or she did his or her work independently and that he or she used no other sources and aids other than those indicated and that he or she properly indicated all quotations and paraphrases. Unpublished articles must also be indicated in the list of references. For the declaration on oath a standard form issued by the Central Examination Office must be used. Upon submission of the Master's thesis the declaration shall be signed and delivered as an integral part of the Master's thesis.

## § 17

### Submission and Evaluation of the Master's Thesis

- (1) The Master's thesis shall be submitted in duplicate to the examination board within the time limit, in addition, it shall be submitted in an electronical version suited for plagiarism-detection software; the date of submission shall be recorded. In case of delivery by mail, the date of postmark is decisive. If the Master's thesis is not submitted within the time limit, it shall be deemed as "not sufficient" (5.0).
- (2) The Master's thesis shall be examined and evaluated by two examiners. One of the examiners shall be the person who supervises the thesis. The second examiner shall be appointed by the chairman of the examination board. Each evaluation shall be effected according to § 15 paragraph 1 and must be justified in writing.
- (3) The grade of the Master's thesis shall be composed of the arithmetic average of the single evaluations unless the difference is more than 1.0. If the difference is more than 1.0, or one of the examiners evaluates the Master's thesis as "not sufficient" (5.0), the examination board shall appoint a third examiner for the evaluation of the Master's thesis. In this case, the grade of the Master's thesis shall be composed of the arithmetic average of the two better grades. However, the Master's thesis can only be evaluated as "sufficient" or better if at least two of the grades are "sufficient" or better. § 15 paragraph 8 applies accordingly.
- (4) The candidate can appeal the evaluation of the Master's thesis not later than 2 months after the date of submission.

## §18

### **Additional Qualification**

- (1) Prior to the passing of an examination or the definitive failure, the students can take additional examinations in other modules than the compulsory ones. However, students cannot acquire credit points with these additional examinations.
- (2) Additional subjects shall not be included in the calculation of the final grade. However, upon request from the students the results of the examinations in these additional subjects shall be recorded in the transcript of records.

## § 19

### **Transcript, Attestations for a change of universities**

- (1) The candidate shall receive a transcript of the successful Master's examination at the latest four weeks after the evaluation of the last examination. The transcript shall include the date on which the last examination was passed. The transcript shall show the final grade of the Master's examination, the subject of the Master's thesis, the modules and module grades as well as the number of credit points acquired in the individual modules. The designations of the modules and individual requirements of the modules as well as the lecturers shall be indicated.
- (2) Upon request from the candidate the transcript can show additional studies, which have not been calculated into the module and final grade because they exceeded the maximum limit of credit points within one module.
- (3) The transcript shall include a supplementary diploma. It shall specify the essential content on which the Master's degree is based, the programme schedule, the acquired competences as well as the awarding university. The Diploma supplement shall be issued in German and English. In addition, a survey of the completed achievements (Transcript of records) shall be attached to the transcript including the final grade of the Master's examination as well as the ECTS-grades according to § 15 paragraph 12.
- (4) Upon request from the candidate, prior to the completion of the Master's examination, a certificate shall be issued attesting to the passed examinations (Notenbescheinigung [Certificate of grades]) including a list of the successfully passed modules with the acquired credit points and passed examinations and the grades

according to § 15 paragraph 1. The candidates can apply for such a certificate only once in a semester.

- (5) The transcript shall be signed by the chairman of the examination board.
- (6) Upon request from the candidate in consultation with the examination board, the transcript and the attestations can also be issued in English.

## **§ 20**

### **Master's diploma**

- (1) The candidate shall receive a Master's diploma in German and English effective from the date on the transcript. The Master's diploma shall certify to the conferring of the Master's degree according to § 4. It shall indicate the Master's degree programme of the graduates.
- (2) The Master's diploma shall be signed by the dean of the Faculty of Biochemical and Chemical Engineering and the chairman of the examination board and shall be affixed with the seal of the Faculty of Biochemical and Chemical Engineering .

## **III. Final Provisions**

### **§ 21**

#### **Invalidity of a Master's examination, Withdrawal of a Master's degree**

- (1) If the candidate cheated on an examination and this fact is revealed only after the conferral of the transcript, the examination board shall have the right to rectify ex post the grades of those examination requirements on which the candidate cheated and declare the examination to be completely or partly failed.
- (2) If the qualifications for admission to an examination were not fulfilled but the candidate was not guilty of deception and if this fact is revealed only after the conferral of the transcript, this fault can be corrected by passing the examination. If the candidate wrongly and deliberately effected admission, the examination board shall decide on the legal consequences taking into account the Administrative Procedure Act for the Federal State of North Rhine–Westphalia.

- (3) Before a decision according to paragraph 1 and 2 is reached, however, the candidate concerned shall be given the chance to make an oral or written statement.
- (4) If a decision according to paragraph 1 or paragraph 2 sentence 2 is taken the invalid transcript shall be confiscated and, if necessary, a new transcript shall be issued. According to paragraph 1 or paragraph 2 sentence 2, reaching a decision is impossible after a period of 5 years from the date of issue of the transcript.
- (5) The Master's degree can be withdrawn and the document confiscated if it later turns out that it was acquired by fraud or if substantial conditions for its awarding were erroneously regarded as fulfilled. On the withdrawal, however, the Faculty Council of the Faculty of Biochemical and Chemical Engineering shall decide.

## **§ 22**

### **Viewing of Examination Records**

- (1) After the announcement of the results of the written examination of one examination section, the candidate shall be allowed to view the written examinations. The date and place of the viewing shall be fixed by the examiners and announced in an appropriate form at the latest on the day of the examination.
- (2) Viewing of further written examinations, the corresponding comments of the examiners and the examination protocols of the oral examinations shall be allowed upon request.
- (3) The application must be made within three months of announcement of the examination results to the chairman of the examination board. The date and place of the viewing shall be fixed by the chairman of the examination board.

## **§ 23**

### **Application area, starting date and publication of the new regulations**

- (1) These examination regulations shall be published in 'Amtliche Mitteilungen' of the Technische Universität Dortmund and go into effect on April 1<sup>st</sup>, 2015.

- (2) These examination regulations shall apply to all students who have been enrolled in the summer semester 2015 in the Master's degree courses for Biochemical and Chemical Engineering at the Technische Universität Dortmund.
- (3) For students who have been enrolled in the winter semester 2010/2011 and before the summer semester 2015 in one of the Master's degree courses in chemical engineering and biochemical engineering at the Technical University of Dortmund, § 7 paragraph 6 and 10 and § 15 paragraphs 2, 4 to 10 apply accordingly.

Issued on the basis of the decisions of the Faculty Council of the Faculty of Biochemical and Chemical Engineering from ... and the decisions of the Rectorate of the Technische Universität Dortmund from December 15<sup>th</sup>, 2015.

Dortmund dated ...

Technische Universität Dortmund

The Rector

University professor

Dr. Dr. h. c. Ursula Gather

**Appendix 1: Modules of the Master's degree courses in Biochemical Engineering, Master's degree courses in Chemical Engineering, Master's degree courses in Chemical Engineering in the area of study Process Systems Engineering**

<b>Compulsory Modules of the Master's Degree Programme in Biochemical Engineering</b>				
<b>Module</b>	<b>Credit Points</b>	<b>Examination</b>		
			<b>Module examination</b>	<b>Individual requirements</b>
Biochemical Process Engineering	6	Marked oral examinations or written examinations	x	
Molecular Biotechnology 1	6	Marked oral examinations or written examinations		x
Master's Thesis	30	Marked written preparation and final colloquium	x	

<b>Compulsory electives of the Master's Programme in Biochemical Engineering . Three compulsory electives must be chosen.</b>				
<b>Module</b>	<b>Credit Points</b>	<b>Examination</b>		
			<b>Module examination</b>	<b>Individual requirements</b>
Analytics and Quality Assurance	7	Marked oral examinations or written examinations	x	
Pharmaceutical Process Engineering	7	Marked oral examinations or written examinations	x	
Process performance optimization	5	Marked oral examinations or written examinations	x	
Process Technology 2	8	Marked oral examinations or written examinations		x

**Free electives of the Master's Programme in Biochemical Engineering**

Free electives with a total of 26 to 29 credit points must be chosen depending on the composition of the compulsory electives. The free electives are shown in the module description of the module handbook.



**Compulsory electives of the Master's Programme in Chemical Engineering . Five modules with a total of at least 24 credit points must be chosen.**

Module	Credit Points	Examination	Module examination	Individual requirements
Chemical Technology	5	Marked written examinations	x	
Conceptual Design	4	Marked written examinations or oral examinations	x	
Mechanical Process Engineering	5	Marked written examinations or oral examinations	x	
Process Performance Optimization	5	Marked written examinations or oral examinations	x	
Reaction Engineering	5	Marked written examinations , unmarked tests		x
Fluid Mechanics	5	Marked written examinations or oral examinations		x
Fluid Separation processes	5	Marked written examinations	x	
Numerical Mathematics	6	Marked written examinations	x	
<b>Compulsory module of the Master's Degree Programme in Chemical Engineering</b>				
Master's Thesis	30	Marked written preparation and final colloquium	x	

**Free electives of the Master's Programme in Chemical Engineering**

Free electives with a total of 34 to 36 credit points must be chosen depending on the composition of the compulsory electives. The free electives are shown in the module description of the module handbook.

**Compulsory modules of the area of study Process Systems Engineering (PSE) of the Master's Degree programme in Chemical Engineering**

<b>Module</b>	<b>Credit Points</b>	<b>Examination</b>	<b>Module examination</b>	<b>Individual requirements</b>
Conceptual Design	4	Marked written examinations or oral examinations	x	
Fluid Separations	4	Marked written examinations	x	
Project Work*	10	Marked term assignments, presentations	x	
Particle Technology	4	Marked written examinations or oral examinations	x	
Modelling and Simulation	10	Marked written examinations or oral examinations		x
Process Performance Optimization	5	Marked written examinations or oral examinations	x	
PSE Lab	3	Unmarked tests		x
Reaction Engineering	4	Marked written examinations	x	
Master's Thesis	30	Marked written preparation and final colloquium	x	

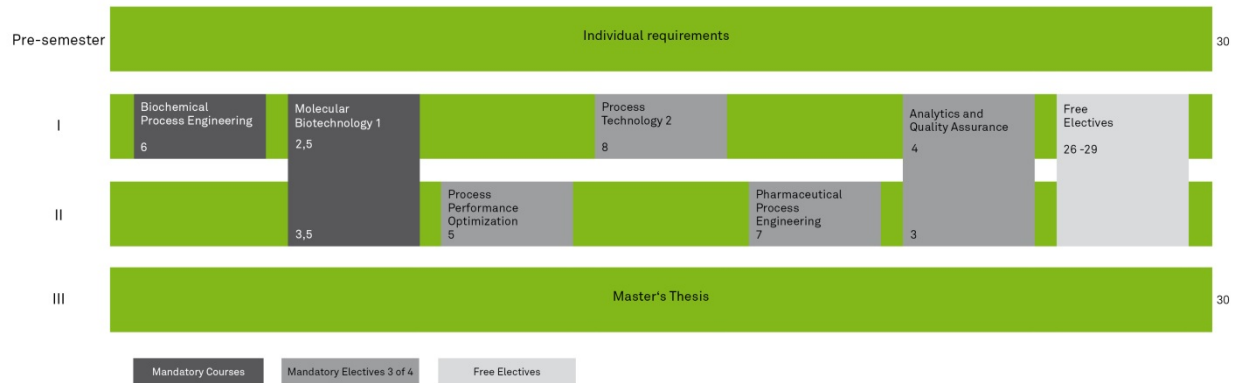
- The module „Project Work“ has to be chosen only if a comparable module was not successfully completed in the Bachelor's degree programme (cf. § 6 paragraph 3).

**Free electives in the area of study Process Systems Engineering (PSE) of the Master's degree programme in Chemical Engineering**

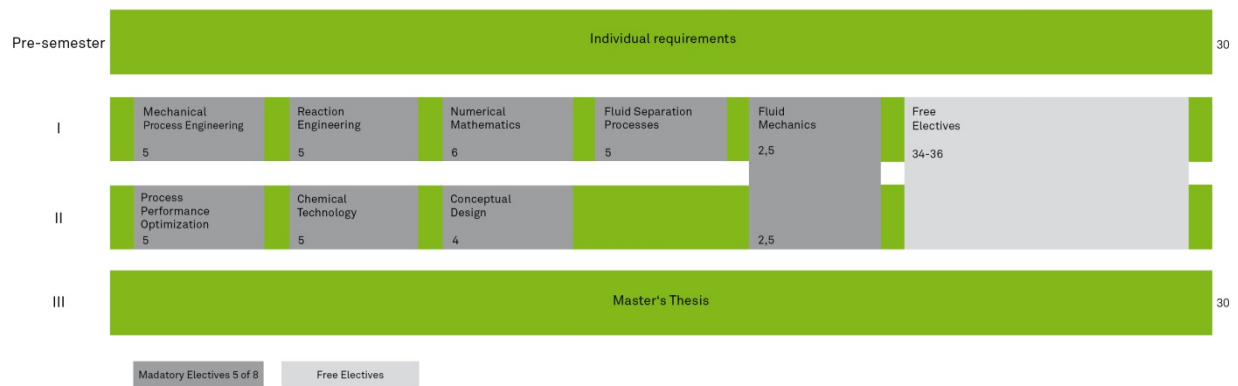
Free electives with a total of 26 credit points must be chosen. If the module „Project Work“ must be chosen according to § 6 paragraph 3, the range is reduced by 10 credit points. The free electives are shown in the module description of the module handbook.

## Appendix 2: Scheduling of the different programmes

### Master's degree courses in Biochemical Engineering



### Master's degree courses in Chemical Engineering



### Master's degree courses in Chemical Engineering in the area of study Process Systems Engineering

