

***Dear students,
Please note that this is an unofficial translation that we
provide as a service. Legally binding are the German
Examination Regulations. In case of any questions please
contact the team for International Student Programmes
of RWTH International Academy.***

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**Examination Regulations for the
Production Systems Engineering
Master's Degree Course
at
RWTH Aachen University**

On the basis of § 2 Sect. 4 of the Law Concerning the Colleges and Universities of the State of North Rhine-Westphalia (Higher Education Act/"Hochschulgesetz") of 31 October 2006 (GV. Law and Ordinance Gazette of NRW, p.474), last amended by Article 2 of the Act Concerning the Expansion of the Universities of Applied Sciences in North Rhine-Westphalia of 8 October 2009 (GV. NRW 2009, p. 516), RWTH Aachen University has enacted the following examination regulations:

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I. General Information

§ 1

Scope and Academic Degree

- (1) These examination regulations apply to the Master's degree course "Production Systems Engineering" offered by the Faculty of Mechanical Engineering.
- (2) In case of successful completion of the Master's programme, the Faculty of Mechanical Engineering awards the academic degree of "Master of Science RWTH Aachen University (M.Sc. RWTH)".

§ 2

Objectives of the Degree Course and Language Provisions

- (1) In the Master's degree course Production Systems Engineering, the knowledge obtained in the Bachelor's degree course will be expanded and deepened in such a way that the graduate is capable of dealing with complex problems and independently undertaking scientific and research work.
- (2) The Master's degree course is a Master's degree course requiring post-graduate work experience.
- (3) The course is mainly taught in English.
- (4) The Master's thesis may be written in either German or English.

§ 3

Admission Requirements

- (1) The admissions requirement is a recognised first university degree which gives evidence of the required qualification for the Master's degree course. Recognised are university degrees that have been approved or officially accredited by a responsible public authority of the country in which the university is located.
- (2) In order to be sufficiently qualified for the Master's course the student applicant must have acquired the necessary knowledge in the following areas:
A total of 120 Credit Points (CP) from the areas of engineering, mathematics and science.

Those are provided based on the below listed basic modules of the Bachelor's degree programme in Mechanical Engineering of RWTH Aachen University or comparable compensations:

Modul	CP
Mathematics	75 CP
Mechanics	
Material Science	
Thermodynamics	
Informatics/Programming	
Physics	
Machine design / -elements	
Fluid Dynamics	45 CP
Control Engineering	
Design	
Production Management	
Machine Tools	
Quality Management	
Manufacturing Technology	
Material Engineering	
Fluid Technology	
Electrical Drives	

- (3) The Board of Examiners may admit a student to the programme on the condition that he or she obtains additional qualifications before registering for the Master's thesis. The type and extent of such additional requirements are determined individually by the Board of Examiners on the basis of the student's qualifications and expertise gained through the prior degree course. This assessment will be done in consultation with the course coordinator or subject area advisor. For student applicants with a bachelor degree of 6 semesters regular study period, the Board of Examiners will identify additional required subjects totalling 30 CP, which have to be taken before the student registers for the master's thesis. In case, additional requirements of more than 30 CP are needed in order to fulfil the above mentioned admission requirements, admission to the master's degree course in Production Systems Engineering is not possible.
- (4) For a degree course that is mainly in English, student applicants who have not obtained their academic qualification at an English-language institution or who are not English native speakers must prove sufficient fluency in English. The following language certificates are recognised:
- The Test of English as Foreign Language (TOEFL) "Internet-based" test (iBT) with a result of at least 90 points
 - The TOEFL "paper-based" test (PBT) with a result of at least 577 points
 - IELTS test with a result of at least 5,5,
 - Cambridge Test – Certificate in Advanced English (CAE)
 - First Certificate in English (FCE) with a minimum grade of B,
 - Common European Framework of Reference Certificate of B2 English Language level. This level can be proved, for example, by a school leaving certificate from Germany ("Abiturzeugnis") stating that English was attended continuously until the end of qualification phase 1 (year 11 in G8 scheme, otherwise year 12) and concluded with the grade of "sufficient".
 - Placement-Test of the RWTH Aachen University language center with a result of minimum B2.

- (5) Moreover, practical professional experiences of as a rule not less than one year is required. This can be completed in whole or in part as practical training or in form of work experience in relevant areas for the master's course of study during or after the first recognised university degree. Students may furthermore admit to the programme on the condition that missing time periods of professional experiences will be obtained in the course of the four semesters of the master programme.
- (6) Student applicants who have already participated in a Master's course at RWTH or any other university must apply to have previous examination results credited before enrolling in or before changing to the master's course. This applies irrespective of whether these exams have been passed or failed.
For student applicants with a bachelor's degree of 8 semesters regular study period, the Board of Examiners can, after request, individually waive examinations totalling 30 CP.
- (7) The Board of Examiners determines, in consultation with the Registrar's Office, whether the admission requirements are fulfilled. In case of foreign applicants, the Board will consult with the International Office.

§ 4

Standard Period of Study, Scope of the Degree Course, and Credit Points

- (1) The standard period of study, including the completion of the Master's thesis, amounts to three semesters. The degree course can be started in the winter semester and in the summer semester.
- (2) The degree course has a modular structure. In the individual modules, the respective subject areas are being taught and the relevant competencies developed. Student performance can be evaluated through an exam or any another form of assessment. The degree course, including the Master's thesis module, contains a total of 12-13 modules. All modules are specified in the module catalogue (see Appendix 1).
- (3) The examination performances achieved in the individual modules are evaluated according to § 9 and contribute to the overall grade (in the form of weighted credit points). CPs are not only awarded according to the scope of the module, but also reflect student effort for preparation, revision, and examinations (private study). A CP corresponds to an estimated workload of about 30 hours. A semester as a rule comprises 30 CPs, which means that 90 CPs are required for the award of the degree.
- (4) Required coursework, without the German course but including the DSM examination and the master's thesis amounts to 40-41 class hours per week (contact hours in lecture hours per week).
One lecture hour per week corresponds to a 45-minute class every week during the semester teaching period. The specified lecture hours per week represent the duration of the classes only – in addition, students require time for preparation and revision of classes. Student learning time is accounted for through the award of credits as outlined in paragraph 3.
- (5) Through the provision of classes, RWTH International Academy gGmbH ensures that students are able to complete their degree within two years (i.e. the standard period of study) and that the modules required for the degree, including all examinations as well as the Master's thesis, can be completed within the respective deadlines.

§ 5 Registration and Admission to Classes

- (1) Students must register for each course via a modular registration procedure. The registration deadline and procedure will be announced in the CAMPUS Information System in a timely manner. A so-called "orientation cancellation" of a semester class is possible until the last Friday in May or November (orientation phase). Please note however that a cancellation of block courses is possible up until a day prior to the first day of the course.
- (2) If the necessity arises due to envisaged study goals, capacity of teaching staff or similar reasons, the number of participants for a course may be limited as regulated in § 59 Abs. 2 HG. Students, who have to participate in the given course as a compulsory course are given preference. Further criteria are (in order of relevance): Compulsory elective courses, elective courses, optional courses (§ 6 Abs. 1), voluntary additional courses (§ 8 Abs. 1) and free access (Absatz 1).

§ 5a Attendance in Courses

- (1) Attendance can be mandatory in certain courses, in case the learning goals of the course cannot be reached without active participation of the students.
- (2) Courses of the following type in the master's degree course in Production Systems Engineering can be with mandatory attendance:
 1. Exercises
 2. Seminars and Proseminars
 3. Colloquia,
 4. Laboratory Exercises
 5. Excursions
 6. Projects
 7. Business Games
- (3) The courses with mandatory attendance are mentioned as such in the module catalogue.
- (4) The number of courses students may miss in a course with mandatory attendance are individually determined per course. The percentage of accepted absence may vary between 10% and 30% of the determined contact hours. This includes absence with a doctor's note. As a rule, the accepted time of absence totals 2 SWS. In case students miss more than the accepted time of absence, individual agreements with the lecturer may be taken to cover the contents of the missed courses with additional work., in order to still reach the learning goals of the course.
- (5) The lecturer will announce the number of accepted absence in the course as well as further regulations at the beginning of the lectures.

§ 6 Examinations and Examination Deadlines

- (1) The Master's examination consists of the examinations for the individual modules as well as the Master's thesis. The examinations and final thesis should be completed within the standard period of study. Only registered students may take examinations. The modules within the curriculum can be divided into compulsory and core elective modules and, if applicable, optional modules. Compulsory modules are modules which a student is required to take. Students may choose a certain number of core elective modules from a list of modules. In addition, there is a range of free electives from which the students can choose. Free electives must be differentiated from additional modules as listed in § 8. Additional modules are modules that are not included in the curriculum, but may be taken by the students voluntarily, i.e. in addition to the curriculum, but only out of the portfolio of RWTH International Academy gGmbH.
- (2) Class attendance requires modular registration. When registering for classes in compulsory and core elective modules, it is possible for students to select an option for automatic registration for the class examination. This registration takes place automatically on 1 December for the winter semester and on 1 June for the summer semester. This does not affect § 5 Section 1, however.
- (3) Students should take classes at the point during the degree programme as defined in the curriculum. The precise registration and cancellation procedures are announced through the CAMPUS Information System.
- (4) The Board of Examiners makes sure that during examination periods, students may take examinations for those classes which are part of the Master's examination. For these classes, at least two examination dates must be offered every year; the dates of written examinations are to be announced at the beginning of the class.
- (5) The legal maternity and parental leave periods as well as times of absence due to the responsibilities for care of children as defined in § 25 Sect. 5 of the German Federal Education and Training Assistance Act (*Bundesausbildungsförderungsgesetz*) and for care of spouses, registered partners, direct relatives or in-laws must be taken into consideration.
- (6) If a candidate is not able to take an examination, partially or in its entirety, due to longer-lasting or permanent physical disability or chronic illness, and provides a medical certificate as evidence for his or her condition, the Chair of the Board of Examiners must permit the candidate to take an equivalent examination in another form. If a degree course requires mandatory industrial placements or study abroad periods, equivalent qualifications are to be defined for those students who, due to their medical condition, are not capable of completing them, despite the support provided by the University.
- (7) Students on leave are not authorised to obtain credits or take examinations. This does not apply to the re-sit of a failed examination and for assessments (experience reports) for the study abroad or practical training period for which the leave was granted. It also does not apply if the leave is due to responsibilities for the care of children according to § 25 Sect. 5 *Bundesausbildungsförderungsgesetz* or due to the care of spouses, registered partners, or direct relatives or in-laws.

§ 7 Types of Examination

- (1) As a rule, the assessment of student achievement takes the form of written or oral examinations. An examination may also take the form of an oral presentation, a term paper, a research paper, a project paper, or a colloquium. As part of the completion of a module, proofs of participation (“Teilnahmenachweis”, ungraded) as well as assessments (“Leistungsnachweis”, graded) may be required. Certain assessments and proofs of participation may be defined as admission requirements for further assessments to be completed as part of a module. Assessments can be take the same form as examinations. A proof of participation certifies that the student has regularly attended a class and participated in class discussion.
- (2) The form and materials/aids allowed in the examination are typically announced at the beginning of a class. At the latest, they must be announced four weeks prior to the examination. This does not affect the validity of § 13 Sect. 5. In the case of several examinations, information must be provided on how the individual grades achieved contribute to the overall grade for the class.
The date of the examination as well as the name of the examiner must be announced in the CAMPUS system by mid-May (summer term) or 15 December (winter term) at the latest. In case of oral examinations, an individual date may be arranged, the name of the examiner, however, must be specified by the above dates.
- (3) In **oral examinations**, candidates are expected to demonstrate their understanding and breadth of awareness of the subject area and that they are able to classify specific problems within the field. The oral examination is also to assess whether the candidate has acquired a wide basic knowledge. Oral examinations are held either by several examiners (oral examination by panel) or by one examiner in the presence of a co-competent assessor. In case of group examinations, the maximum number of candidates is four.
In the oral exam, each candidate is interviewed by only one examiner in the subject area under examination. Before deciding on a grade according to § 9 Sect. 1, the examiner must consult with the assessor. Written notes of the contents of the exam and the candidate’s performance must be taken. The candidate is to be informed of his or her grade right after the oral examination. For each candidate, The duration of an oral examination is at least 15 minutes and 45 minutes at most. In the case of a supplementary oral examination according to § 13 Sect. 2, the assessment by one examiner is sufficient. In case of a group examination, care must be taken that the above named examination duration is observed for each candidate.
- (4) Students who want to take the examination in a later examination period can be allowed to be present at the examination, provided that sufficient space is available and that the candidate agrees to auditors being present. These auditing students are not allowed to be present during the examiners’ consultation and the announcement of the examination results.
- (5) In **written examinations**, candidates are to demonstrate that they are able to identify and find ways to solve a discipline-specific problem in a limited period of time and with limited resources, using established methods and approaches. The duration of a written examination is between 60 and 240 minutes.
- (6) Multiple choice tests may also be used as part of written examinations. Details concerning the assessment of tests can be found in § 9 Para. 2 and 3.

- (7) Every written examination is to be graded by the examiner. If a written examination is graded by two examiners according to § 13 Para. 4, the grade of the written examination is calculated from the arithmetic mean of the individual assessments. The examiners can assign suitable research assistants who are knowledgeable in the subject matter and have a relevant Master's degree (or equivalent or a higher degree) to perform the preliminary assessment of the written examination. In case of a supplementary oral examination according to § 13 Para. 2, the assessment by one examiner is sufficient.
- (8) An **oral presentation** is a talk with a minimum duration of 15 and a maximum duration of 45 minutes, based on a written paper. The presentation is to demonstrate that the candidate is able to provide a scientific/scholarly analysis of a specific topic, taking into account the relevant contexts of the subject area, and present the results orally.
- (9) In a **written term paper**, a problem from the subject area of the class is thoroughly addressed and possible solutions are presented, drawing on the relevant literature and, if applicable, to suitable aids and materials. Suitable aids and materials are announced as part of the term paper assignment. § 7 Para. 7 Sentence 2 applies accordingly.
- (10) **Written homework** assigned and evaluated during the semester are to gradually prepare students for subsequent examinations. Homework assignments may contribute up to 10 percent to the final grade for a class. The instructor is to provide precise criteria for obtaining bonus points at the beginning of the semester or by the first day of the course; this information is to be announced in the CAMPUS System.
- (11) Within the scope of a **project paper**, a minor, well-defined scientific problem is to be independently addressed in writing. The project is undertaken under supervision.
- (12) Within the scope of a **research paper**, students address a topic from the subject area of the Master's degree course.
- (13) Examinations as outlined in paragraphs 8 through 11 can also be approved as group work as long as the assessment of each group member's individual contribution is possible.
- (14) In the **colloquium**, students are to demonstrate in a discussion of 30 - 60 minutes duration with the examiner and other participants that they are familiar with the subject matter of the course and are able to classify questions and problems in the contexts of the discipline. The colloquium can begin with an oral presentation as outlined in section 8.
- (15) In the **practical training/lab course**, students learn to perform independent experimental work, evaluate results, and present measuring results in a scientific manner. To arrive at an assessment of the practical training, the students' knowledge of the subject matter, their experimental skills, and the quality of their scientific analyses can be evaluated. If the practical training is performed in small groups, the performance of the individual student is to be evaluated.

§ 8 Additional Modules

- (1) The candidate can take examinations in further modules of his or her choice (additional modules), but only out of the privately taught portfolio of RWTH International Academy gGmbH.
- (2) The results of examinations taken in these modules may, upon request by the candidate, be listed in the final academic transcript. These results however do not contribute to the overall grade of the degree.

§ 9 Assessment and Grades

- (1) The grades for the individual examinations are determined by the respective examiners. For the evaluation, the following grades are to be used:

1 = Very good	An excellent performance
2 = Good	A performance which is clearly above the average requirements
3 = Satisfactory	A performance that meets the requirements
4 = Sufficient	A performance that still meets the requirements, despite being flawed
5 = Unsatisfactory	A performance that does not meet requirements due to substantial flaws

By raising or lowering the individual marks by 0.3, intermediate values can be formed for a differentiated evaluation. The grades 0.7, 4.3, 4.7, and 5.3 are excluded. Performances that are not graded obtain an evaluation of "Pass" or "Fail."

- (2) Multiple choice is a format used in examinations which provides a number of pre-given answers to a question for selection. The evaluation criteria must be announced on the test sheet as well as on a bulletin board or in the CAMPUS Information System (14 days prior to the examination). A test which consists solely of multiple choice questions is considered to be passed if
 - a) 60% of the questions asked are answered correctly or
 - b) the number of correctly answered questions does not fall short of 22 percent below the average performance of candidates who have participated in the test for the first time.
- (3) If the candidate has answered the minimum number of questions correctly according to Paragraph 2 and thus passed the test, the mark is as follows:
 - Very good if he or she has answered 75%
 - Good if he or she has answered at least 50%, but less than 75%
 - Satisfactory if he or she has answered at least 25%, but less than 50%
 - Sufficient if he or she has answered 0% or less than 25%of questions in excess of the minimum number correctly.
- (4) If a written examination consists of both multiple choice and other types of questions, the

multiple choice questions are evaluated according to paragraphs 2 and 3. The other questions are evaluated according to the method usually used for the respective type of question. The grade is determined taking into account the weighted results of both parts of the examination. The weighting is to be performed according to the percentage of both types of questions (multiple choice and other) in the written examination.

- (5) An evaluation of the examination takes place only when the candidate is enrolled in the degree course at the time of the examination or submission of the assignment to be evaluated. The grade awarded for the examinations must be announced after six weeks at the latest, and it must be ensured that the assessment takes place at least ten days prior to a possible resit examination. The students are automatically informed via email (to their RWTH email address) of their achieved grades through the CAMPUS Information System; also, the examination results are posted on a bulletin board. Students can also obtain their current transcript through CAMPUS.
- (6) An examination is considered to be passed when the mark is at least "Sufficient" (4.0). If an examination consists of several partial performances, the mark takes all partial performances into consideration. In the process, every partial performance must be evaluated with a minimum mark of "Sufficient" (4.0) or have been passed. For the marks, Paragraph 7 applies accordingly.
- (7) A module is considered passed if all examinations which are part of the module have been passed with a minimum mark of "Sufficient" (4.0) and all CPs that belong to it (e.g. proofs of participation and assessments) have been earned. For each module, the CPs are credited according to the appendix (see module catalogue).
- (8) The overall grade is formed from the marks of the modules and the grade of the Master's thesis.
The overall grade of a passed Master's examination may be as follows:

Average grade to 1.5	= Very good
Average grade between 1.6 and 2.5	= Good
Average grade between 2.6 and 3.5	= Satisfactory
Average grade between 3.6 and 4.0	= Sufficient

Upon request by the candidate to the Board of Examiners, the least favourable of the weighted module grades from the module areas is not taken into consideration for the final grade. As a prerequisite, all module examinations must have been completed in the standard period of study.

- (9) For the calculation of the grades and the overall grade, individual grades are rounded down to one decimal place. All other decimal places are not taken into account.
- (10) The overall grade of "Passed with Honours" ("Mit Auszeichnung") is awarded if for the Master's Thesis, a grade of "1.0" is awarded and the weighted average of all other grades attained in the Master's examination is 1.3 or better. This grade is awarded instead of the grade "Very Good" as outlined in paragraph 7.

§ 10
Board of Examiners

- (1) For the organisation of the examinations and the tasks and responsibilities resulting from the present examination regulations, the Faculty of Mechanical Engineering will form a Board of Examiners. The Board of Examiners consists of the Chair, the deputy chair, and five other members with voting rights. The Chair, Deputy Chair, and two other members will be selected from among the group of professors, one member from among the research assistants, and two members from among the group of students. For each member of the Board of Examiners, a deputy will be nominated. The term of office of the professorial and research staff members will amount to two years, whilst the term of office for student members will amount to one year. Re-election into the Board is possible.
- (2) The Board of Examiners is a public authority according to the Administrative Procedure Law and the Law of administrative court procedure.
- (3) The Board of Examiners makes sure that the provisions of the examination regulations are observed and that the examinations are properly conducted. In particular, the Board decides on objections to decisions made in the examination procedure. In addition, on a regular basis and at least once a year, the Board of Examiners must present a report to the Faculty containing statistics and general data on examinations and periods of study. It provides suggestions on how the examination regulations and curricula can be further improved and publishes the distribution of grades and overall grades. The Board of Examiners can transfer the execution of its everyday tasks to the Chair of the Board. This does not apply to decisions regarding objections and the report to the Faculty.
- (4) The Board of Examiners is quorate if, in addition to the Chair and the Deputy Chair, two additional professors with voting rights (or their deputies) and at least two additional voting members (or their deputies) are present. Board decisions shall be made by simple majority. In the event of a tie, the Chair has the casting vote. The student members of the Board of Examiners do not take part in decisions on the crediting of study and examination performances.
- (5) The members of the Board of Examiners have the right to be present during examinations.
- (6) The sessions of the Board of Examiners are not public. The members of the Board of Examiners and their representatives are subject to professional discretion. Insofar as they are not members of the public service, the Chair of the Board of Examiners must see to it that they commit themselves to confidentiality.
- (7) The Board of Examiners obtains administrative aid from the Central Examinations Office (ZPA) in the performance of its duties.

§ 11 Examiners and Co-Assessors

- (1) The Chair of the Board of Examiners appoints the examiners. The examiners appoint co-assessors, if applicable. The appointments must be put on record. Appointed as examiners may be academic staff who have at completed the corresponding or comparable final examination and who have independently taught the section of studies preceding the examination in the respective module. Only if there is good reason, a deviation from this policy is possible. Only people with a corresponding academic degree (or equivalent) may be appointed as co-assessors.
- (2) Examiners are independent in their activities as examiners. § 10 Sect. 6 Sentence 2 applies accordingly. This also applies to the co-assessor.
- (3) The candidate may suggest an examiner for the Master's thesis and the written and/or oral examinations. If possible, the suggestions of the candidate should be taken into consideration. The suggestions, however, do not constitute a legal claim.
- (4) The Chair of the Board of Examiners has to ensure that the candidate is informed of the name of their examiner at least until mid-May (summer term) or mid-November (winter term). A bulletin board notice or announcement in the CAMPUS Information System suffices.

§ 12 Credit for Period of Study, Academic Performance, Examination Performance, and Admission to a Higher Semester of the Degree Course

- (1) Passed and failed performances at another university within the scope of the German Constitution in an equivalent degree course will be credited ex officio. Passed and failed performances in other degree courses or at other universities and at state and officially recognised universities of cooperative education are to be credited upon application if no major differences in content can be identified and substantiated; upon application, the university can credit other qualifications on the basis of submitted certificates and documents.
- (2) Major differences can be attested when the qualifications do not correspond to the requirements of the Master's degree programme Production systems Engineering. The assessment process should not involve a merely schematic comparison, but rather a consideration and evaluation of the entire situation. For the equivalence of periods of study, academic performances, and examination assessments made outside of the scope of the German Constitution, the equivalency agreements approved by the Standing Conference of the Federal Ministers of Education and Cultural Affairs and agreements made within university partnerships must be taken into consideration. Otherwise, in case of doubt of equivalency, the Central Office for Foreign Educational Systems ("Zentralstelle für ausländisches Bildungswesen") can be consulted.
- (3) The student has to submit the documents required for the recognition of external qualifications in German. If there are any documents in a language other than German, officially certified translations are to be included if requested by the Board of Examiners. The documents must contain information on the competencies and qualifications that are to be recognised and credited, including information on the relevant passed and failed examinations and assessments. If periods of study and qualifications from degree programs are to be credited, as a rule, the relevant module descriptions and the Transcript of Records (or an equivalent document) are to be submitted.

The Board of Examiners is responsible for crediting according to Paragraphs 1 and 2. An expert in the respective discipline should generally be consulted to determine equivalency.

- (4) Academic and examination performances by school students who were individually admitted to university classes and examinations as “Young Students” due to their outstanding skills can be credited on application for a degree program taken up at a later stage.
- (5) The Board of Examiners is responsible for the recognition and crediting of qualifications according to Paragraphs 1 to 4. An expert in the respective discipline should generally be consulted to determine equivalency.
- (6) Academic and examination performances are to be credited, the achieved grades – insofar as the grading systems are comparable – are to be included in the calculation of the overall grade. In case of incomparable grading systems, the note "Credited" will be recorded. Credited qualifications are marked as such in the final academic transcript.

§ 13

Resit Examinations, Master’s Thesis, and Expiry of the Right to Take an Examination

- (1) In case of "unsatisfactory" (i.e. failed) performances, the examinations can be repeated twice; the Master's thesis may be repeated once. The candidate may reject the topic of the Master's thesis, but only if he or she has not already taken advantage of this possibility whilst writing his or her first Master's thesis.
- (2) If a candidate receives a mark of "Unsatisfactory" (5.0/failure) when re-sitting a written examination for the second time and if this mark was not given due to an attempt at cheating, default, or withdrawal without good reason according to § 14 Para. 2, the candidate has the chance to take a supplementary oral examination before the examination is considered a “fail” (5.0). The date of the supplementary oral examination is to be set during the post-exam review session. This examination is to be held within four weeks from the date of the post-exam review. For the supplementary oral examination, § 7 Para. 3 applies. Based on the candidate’s performance in the supplementary oral examination, the grade will be either "Sufficient" (4.0) or "Unsatisfactory" (5.0).
- (3) The candidate must register for the repeated Master's thesis within three semesters after the failed first attempt. If this deadline is exceeded, the right to take an examination expires unless the candidate cannot be held responsible for the default. If the candidate takes maternity or parental leave according to §§ 3, 4, 6 und 8 of the Maternity Protection Act (“Mutterschutzgesetz”) or according to the provisions of the Act on Benefits and Leave for Childcare (“Bundeserziehungsgeldgesetz”), this deadline will be postponed accordingly. This also applies if the candidate takes leave for care of persons as specified in § 48 para. 5 HG.
- (4) Written and oral examinations that conclude a degree course according to the curriculum as well as resit examinations for which no compensation possibility is provided in the case of failure must be assessed by at least two examiners. This does not affect § 7 Para. 7.
- (5) Resit examinations may take the form of written and oral examinations, according to the decision of the examiner. Candidates are to be informed on the bulletin board about whether the repeat examination is in written or oral form at least two weeks prior to the examination.

- (6) If an examination consists of several parts, only the part of the examination that was not passed must be repeated.
- (7) A module is considered to be ultimately failed if the examinations required for passing can no longer be repeated.
- (8) The Master's examination is ultimately failed if the individual examinations to pass a module can no longer be repeated or if the second Master's thesis is evaluated as or counts as "Unsatisfactory."

§ 14

Cancellation of Registration, Default, Withdrawal, Cheating, and Violation of the Regulations

- (1) Up until a week before the respective examination date, the candidate may cancel an examination without giving a reason.
- (2) An examination performance is considered to be "Unsatisfactory" (5.0) if the candidate does not appear at an examination without good reason or if he or she withdraws from the examination after the start of the exam without good reason. The same applies if a written examination is not completed within the duration of the exam. In this case, the student has no right to a supplementary oral examination.
- (3) The reasons for the withdrawal or default must be submitted and proven in writing to the Board of Examiners immediately. In case of illness, the candidate must present a medical certificate. In individual cases, the Chair of the Board of Examiners may demand a certificate by an independent medical examiner, to be appointed by the Board of Examiners. If the Board of Examiners does not accept the reasons, the candidate will be informed in writing. The previous examination results are to be credited.
- (4) In the case of written examinations – with the exception of those held under supervision – the candidate must affirm in lieu of an oath that the examination was performed by the candidate him- or herself without impermissible aids or external help.
- (5) If the candidate tries to influence the result of an examination through cheating, for example, the use of impermissible aids, the respective examination is evaluated as "Unsatisfactory" (5.0). The attempt at cheating is ascertained by the respective examiner or invigilator and put on record. A candidate who disturbs the proper course of the examination may generally be excluded from continuing the examination by the respective examiner or the invigilator. In this case, the respective examination is assessed as "Unsatisfactory" (5.0). The reasons for the exclusion must be put on record. In case of multiple or otherwise severe cheating attempts, the candidate may also be excluded from the University.
- (6) The candidate must be informed of incriminating decisions immediately in writing; the basis for these decisions must be thoroughly explained and information on applicable legal remedies must be provided.

II. Master's Examination and Master's Thesis

§ 15

Type and Scope of the Master's Examination

- (1) The Master's examination consists of:
 1. The examinations and other assessments for the modules as listed in Appendix 1
 2. The Master's thesis and the Master's defence colloquium
- (2) The curriculum provides information on the ideal order of the classes, examinations and assessments. Examinations and assessments are taken during the degree course. The topic of the Master's thesis cannot be assigned until 45 CPs have been achieved.
- (3) The contents of the examinations and assessments are determined by the contents of the respective classes as outlined the module manual.

§ 16

Master's Thesis

- (1) The Master's thesis consists of a written paper submitted by the candidate. The thesis is to demonstrate that the candidate is capable of independently addressing a problem using scientific/scholarly methods within a limited period of time. The thesis is written under supervision.
- (2) The Master's thesis has to be written in the area of Production Engineering. The Master's thesis can be assigned and supervised by any professor in the Faculty Mechanical Engineering who is involved in research and teaching activities at RWTH. Assistant lecturers and research assistants may act as assistant supervisors. In exceptional cases and with permission of the Board of Examiners, the Master's thesis can be conducted outside of the Faculty or RWTH, as long as it is supervised by one of the persons named in Sentence 1.
- (3) Upon special application of the candidate, the chair of the Board of Examiners makes sure that the candidate receives the topic for the Master's thesis at the planned time. The candidate must be given the opportunity to make suggestions for the topic.
- (4) The Master's thesis can be written in either German or English as agreed upon with the examiner.
- (5) The Chair of the Board of Examiners informs the candidate of the final deadline for the submission of the thesis. The date on which the candidate receives the thesis topic as well as the title of the topic must be put on record.
- (6) As a rule, the candidate must complete the Master's Thesis within a period of 22 weeks. The written paper should not exceed 80 pages without the appendix. **The topic and task must be designed in such a way that a completion is possible within six months of full-time work. In coordination with the supervisor and the course convenor ("Fachstudienberater/in"), a period of part-time work on the thesis of up to 12 months may be granted. In this case, a written application must be submitted to and approved by the Board of Examiners.** The topic can be rejected only once and only within the first month of the writing period. In individual cases, for good reason, the Board of Examiners can extend the writing period by up to six weeks. This decision is to be based on an

application by the candidate and made in agreement with the thesis supervisor.

- (7) The candidate will present the results of the Master's thesis in a Master's colloquium. In this context, § 7 Para. 14 applies.

§ 17

Acceptance and Assessment of the Master's Thesis

- (1) The Master's thesis is to be submitted on time to Central Examination Office (ZPA). Two copies of the thesis are to be submitted. The date of submission must be put on record. If the Master's thesis is not handed in on time, it will be considered "Unsatisfactory" (5.0/fail). The thesis is assessed only if the candidate is enrolled in the degree course at the time of submission.
- (2) As a rule, the examiner of the thesis is also person who has assigned the topic. The thesis is generally the last part of the Master's examination. In accordance with § 9 Para.1, the thesis should be assessed by two examiners, who provide a written statement on their assessment. The grade for the thesis is calculated from the arithmetic mean of the individual assessments according to § 9 Para. 1 as long as the difference between the assessments is not higher than two grades. If the difference between the grades more than 2.0 or if one evaluation is "Unsatisfactory," but the other "Satisfactory" or better, a third examiner will be appointed by the chair of the Board of Examiners in order to evaluate the Master's thesis. The third examiner will determine the final grade of the Master's thesis, which is to be between the two grades provided by the other examiners, within four weeks.
- (3) The announcement of the grade – with the exception of Paragraph 2 Sentence 4 - will be made within eight weeks after submission. If this announcement does not made on time, the Board of Examiners is authorised to appoint other examiners for the thesis.
- (4) For the writing of the Master's thesis, 30 CPs are awarded.

§ 18

Passing of the Master's Examination

The Master's examination is considered to be passed when all necessary modules are passed and the grade of the Master's thesis is at least "Sufficient" (4.0). With the passing of the Master's examination, the degree course is completed.

III. FINAL PROVISIONS

§ 19

Final Academic Transcript, Degree Certificates, and Certifications

- (1) If the candidate has passed the Master's examination, he or she will receive the final academic transcript within three months after the final examination. The academic transcript lists all modules taken, names the topic of the Master's thesis, and provides all achieved grades and credit points (CP). Also, it includes the overall grade and lists the additional modules completed by the candidate. The overall grade is specified in writing, and is also represented as a number with one decimal place. The final transcript is signed by the Chair of the Board of Examiners.
- (2) The transcript bears the date on which the final examination was passed or the final

assessment provided.

- (3) The transcript contains information in both German and English.
- (4) At the same time as the final academic transcript, the candidate will obtain a degree certificate in German and English which bears the date of the transcript. The degree certificate confirms the award of the Master's degree. The degree certificate is signed by the Dean of the Faculty and the Chair of the Board of Examiners.
- (5) Together with the report, the graduate receives a "diploma supplement" written in German and English. The diploma supplement provides information on the individual subject profile of the completed degree course. The diploma supplement also provides an overview of achieved ECTS points.
- (6) If the Master's examination is finally not passed, the chair of the Board of Examiners will inform the candidate in writing; this letter will also contain information on applicable legal remedies.
- (7) Students that leave the university without a degree will obtain a report of all study and examination performances upon request.

§ 20

Invalidity of the Master's Examination, Deprivation of the Academic Degree

- (1) If the candidate has cheated in an examination and this fact is not discovered until after the final academic transcript has been handed out, the Board of Examiners may subsequently correct the grades of the examinations in which the candidate cheated and declare the examination to be entirely or partially failed.
- (2) If the prerequisites for the admission to an examination were not fulfilled without the candidate intending to cheat and this fact does not become known until after the final transcript has been handed out, this problem can be remedied by the candidate's passing the test. If the candidate wrongly and premeditatedly obtained admission, the Board of Examiners will decide on the legal consequences under observance of the Administrative Procedure Law ("Verwaltungsverfahrensgesetz") of the Federal State of North Rhine-Westphalia.
- (3) Before a decision is arrived at, the candidate in question has the opportunity to make a statement.
- (4) The incorrect final academic transcript must be returned and, if applicable, a new one will be issued. A decision according to Paragraph 1 and Paragraph 2 Sentence 2 is excluded after a period of five years after the final academic transcript is issued.
- (4) If the examination is declared to be failed as a whole, the academic degree will be withdrawn by the Faculty. Also, the degree certificate will be withdrawn.

§ 21

Viewing of Examination Scripts (Post-Exam Review)

- (1) The candidate must be able to view the corrected written examination or paper after the grades have been finalised. The candidate will be informed of the time and place of the post-exam review session during the examination or when receiving the grade at the latest. The student must be given sufficient time for viewing, at least 30 minutes.
- (2) Insofar as Paragraph 1 does not apply, the candidate will be permitted to view the written

examination, the related comments by the examiners, and the examination reports upon application at the end of the examination procedure.

- (3) The application must be submitted to the Chair of the Board of Examiners within a month of the receipt of the final academic record. The Chair of the Board of Examiners sets the time and location of the viewing session.

§ 22

Coming into Effect, Publication, and Transitional Regulations

- (1) These examination regulations enter into effect on the day of publication and are published in the Official Announcements of RWTH Aachen University (“Amtliche Bekanntmachungen”) and applies to all students enrolled in the master’s degree programme Production Systems Engineering at RWTH Aachen University.
- (2) Students, who selected modules which are changed by these examination regulations before the winter semester 2014/15, may finish those modules until the end of the winter semester 2016/17 under the previous conditions. After request to the examination board, new modules may be taken.
- (3) Students, who are in a pending examination procedure with modules that are being changed by these regulations may finish the pending modules until the end of the winter semester 2016/17.

Appendix for the General Requirements for a Master's Course of Study

Glossary

Academic degree

After successful completion of the degree programme, an academic degree is awarded.

In the case of a Master's degree course, the academic degree of "Master of Science RWTH Aachen (M.Sc. RWTH)" is awarded. For an arts and humanities Master's course, the academic degree of "Master of Arts RWTH Aachen University (M.A. RWTH)" is awarded.

Academic transcript

An academic transcript is a full record of your academic study at RWTH Aachen University and includes all assessments (with grades) achieved at the time of issuance.

Accreditation

Accreditation is a quality assurance tool for degree programmes. Its objective is to guarantee high quality of courses by determining minimum standards. Accreditation is performed by a university-external professional body (a council, agency, or commission) which checks courses according to given standards and decides whether the programme meets the respective requirements.

Additional module

Additional modules are modules that are not included in the curriculum, but may be taken by the students additionally and voluntarily.

Assessment / Proof of performance

In general, "assessment" is a generic term for a set of processes that measure student achievement of the intended learning outcomes in terms of knowledge acquired, understanding developed, skills gained and attributes demonstrated. In a related meaning, an "assessment"/"proof of performance" can also be a document which certifies that the student has successfully passed an examination. Individual assessments (e.g. for a certain class) certify a type of qualification, which may serve as an admission requirement for further (typically more advanced) assessments taken at a later stage. Assessments can take the form of written examinations, oral examinations, oral presentations, research papers, and so on.

Block course

A block course is a course that does not take place over an entire semester, but rather concentrated over a few days, for example, a week.

Board of Examiners

For organisational matters pertaining to examinations, the faculties establish so-called Boards of Examiners. For further details, please refer to the examination regulations.

CAMPUS Information System

CAMPUS is the web-based information system of RWTH Aachen University. In addition to online services, it contains the University calendar and facilitates the registration and

cancellation of courses and examinations. It also provides examination regulations and a personal student portal which provides a timetable functionality.

Cancellation

It is possible for students to withdraw from examinations. The provisions on withdrawal from entry to examinations are given in the respective examination regulations.

Compulsory area

The compulsory area classes/compulsory modules are mandatory and must be taken by all students in the degree course.

Credit points

The examinations undertaken in the individual modules are assessed and weighted by their credit values (CPs).

CPs are not only awarded according to the scope of a class or module, but also reflect student effort for preparation, revision, and examinations (private study). A CP corresponds to an estimated workload of about 30 hours. A semester generally comprises 30 CPs. For the Master's degree course, students must successfully complete a total of 120 CPs.

Curriculum

The word "curriculum" is occasionally equated with "syllabus." A syllabus however is generally limited to a description of instructional content. The curriculum is more oriented towards providing instruction times and the sequence of classes to be taken for the degree course.

Diploma supplement

The diploma supplement (DS) is a separate document that describes the university degrees obtained and the corresponding qualification. The DS explains the German university system and its degrees, as well as the awarding university, often including the concrete content of the completed course of study. The DS is issued in English and German and enclosed with the final report. The DS is also intended to provide employers with information.

Examination performances

Examination performances comprise all assessments to be undertaken as part of the degree programme. This includes visiting classes, written and oral examinations, oral presentations, term papers, research papers, colloquiums, practical training, drafts, and final theses.

Fixed-semester/variable-semester

An assessment or exam performance is a fixed-semester assessment if it must be taken within a defined semester during the programme. Otherwise an assessment is a variable-semester performance, i.e. the student has a certain latitude when to take the exam.

Free elective class

Degree programmes may include classes from a so-called free elective area. Students are required to take a number of free elective classes, but they can freely choose the area of study.

Leave of absence

For good reason, leaves of absence can be granted according to the matriculation regulations. The application for a leave of absence should be made during the re-enrolment period. Information can be obtained from the Registrar's Office at RWTH Aachen University.

Lecture hours per week

A lecture hour per week corresponds to a 45-minute course every week during the lecture period of a semester. The lecture hours per week refer to the duration of the classes (excluding time for preparation, etc.).

Mandatory registration initiated by the Central Examination Office (ZPA) for repeat examinations

The “mandatory registration” is an automatic registration undertaken by the Central Examination Office (ZPA) for all students who have not passed an exam or who have cancelled an exam. As a rule, the student is registered for the at the next possible examination date. Students do not have to be separately notified about this registration; mandatory registrations are displayed in the virtual Central Examination Office as part of the CAMPUS Office information system.

Module

Modules are discrete blocks or units of study leading to specified learning outcomes which are assessed. Modules as a rule comprise several classes dedicated to closely related topics.

Module manual

The individual modules are described in the module manual, containing information on:

- Semester no.
- Duration
- Lecture hours per week
- Frequency
- Cycle (WS/SS)
- Language of Instruction
- Content
- Intended learning outcomes
- Prerequisites
- Grading
- Assessment

The module manual is an important source for the students and must be published by the University.

Modular registration

Modular registration is the registration to an academic event (course, seminar, examination, etc.) for a partial performance within an individual module. Modular registrations are performed using the modular registration procedure of the CAMPUS Information System (Module IT).

Multiple choice

Multiple choice is a format used in examinations in which students must select the best possible answers out of the choices from lists.

Orientation phase

The first five weeks after the beginning of classes are called the “orientation phase.”

Orientation cancellation

The cancellation of classes is possible within the first five weeks.

Post-Examination review session

After the grades for exams have been announced, students are given the opportunity to view the corrected scripts.

Practical work experience

Some degree courses require that students prove practical work experience (practical training). The details can be found in the relevant examination regulations. We advise

potential/prospective students to look for information in a timely manner as several programmes require practical work experience prior to the start of the programme.

Proof of participation

A proof of participation certifies the active participation in a course. A proof of participation may be defined as an admission requirement for assessments or classes.

Required elective classes

Students must take a number of required elective classes from a certain catalogue of classes.

Registration for examinations

Concerning the registration for exams, the processes as outlined on the web pages of the Central Examination Office (ZPA) apply.

Standard period of study

The standard period of study is the period in the degree course can be completed. At RWTH Aachen University, the normal period of study is three or four semesters.

Start of studies

Most programmes start in the winter semester. Only a few programmes start in the summer semester.

Student Advice Centre

The Student Advice Centre provides information, advice and support to students and prospective students who have questions about their studies or who encounter any problems or difficulties. Subject-specific counselling is provided by the relevant faculty advisors and course convenors.

Supplementary oral examination

If the student also fails the second resit of a written examination, i.e. the grade is "Unsatisfactory" (5.0), the student has the opportunity to take a supplementary oral examination. Based on the student's performance in this oral examination, he or she may achieve a grade of either "Sufficient" (4.0) or "Unsatisfactory" (5.0).