

Please note: This publication is an English translation of the examination regulations for the M.Sc. MME-PS created by RWTH International Academy. Only the German original of these regulations as published in the Official Announcements of RWTH Aachen University (“Amtliche Bekanntmachungen”) is legally binding.

Program-Specific Examination Regulations

for the Master’s degree program

Master of Science in Management and Engineering

in Production Systems (MME-PS)

of RWTH Aachen University

dated July 9, 2020

in the second revised version of the Examination Regulations

dated April 23, 2021

published as a complete version

(2020 version of the Examination Regulations)

On the basis of §§ 2 para. 4, 64 of the law governing the universities of the Federal State of North Rhine-Westphalia (Higher Education Act – HEA) in the version of the announcement from September 16, 2014 (GV. NRW p. 547), most recently amended by article 1 of the Act on further protective measures taken in management of the Corona pandemic within the context of higher education from December 1, 2020 (GV. NRW p. 1110), RWTH Aachen University (RWTH) has issued the following examination regulations:

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I. General Information

§ 1

Scope of Application and Academic Degree

- (1) These examination regulations apply to the Master's degree program Master of Science in Management and Engineering in Production Systems (MME-PS) at RWTH Aachen University. They apply in conjunction with the General Examination Regulations (GER) in their relevant applicable version only, and include additional program-specific regulations. In cases of doubt, the General Examination Regulations take precedence over the program-specific Examination Regulations.
- (2) After the successful completion of this Master's degree program, the Faculty of Mechanical Engineering awards the academic degree of Master of Science RWTH Aachen University (M.Sc. RWTH).

§ 2

Types and Objectives of the Study Program and Language Provisions

- (1) This is a Master's degree program for the purpose of further education according to § 2 para. 4 GER.
- (2) The overall educational objectives are set out in § 2 para. 1, 3 and 4 GER. For further information and provisions on the objectives of this Master's degree program, please refer to appendix 3 of the present examination regulations.
- (3) Teaching takes place in the English language.

§ 3

Admission Requirements

- (1) Requirement for admission is a recognized first degree from a recognized university according to § 3 para. 4 GER.
 - (2) To meet the educational prerequisites and successfully complete the Master's degree program Management and Engineering in Production Systems, the applicant must have the necessary competence in the following areas:
 - A total of 120 Credit Points from the fields of engineering, mathematics and natural sciences. The proven performance must be comparable to those of the Bachelor's degree program Mechanical Engineering at RWTH Aachen University.
 - A total of 10 Credit Points from the fundamentals in business administration and economics. The proven performance must be comparable to those of the Bachelor's degree program Business Administration and Engineering: Mechanical Engineering at RWTH Aachen University.
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At least 69 Credit Points	<ul style="list-style-type: none"> - Mathematics I - Mathematics II - Mathematics III - Mechanics I - Mechanics II - Mechanics III - Material Science I - Thermodynamics I/II - Computer Science in Mechanical Engineering - Physics - Machine Design I /Introduction into CAD - Metrology and Quality
At least 40 Credit Points	<ul style="list-style-type: none"> - Fluid Mechanics I - Control Engineering - Construction Design Theory I - Production Management I - Machine Tools - Manufacturing Technology I - Electromechanical Motion Technology - Quality- and Project Management

In addition, all applicants are required to successfully pass the Graduate Record Examination (GRE) General Test. Applications without the GRE will not be considered. The following minimum scores must be achieved in the individual sections:

Verbal Reasoning:	145 points
Quantitative Reasoning:	160 points
Analytical Writing:	3 points

Applicants who are citizens of a member state of the European Union or the European Economic Area (EEA), as well as graduates with a Bachelor's degree from a German university are exempt from this rule.

- (3) When admission is granted on condition of completion of additional requirements, § 3 para. 6 GER applies. If additional requirements corresponding to more than 30 Credit Points are required, an admission to the Master's degree program is not possible.
- (4) For this Master's degree program, proof of adequate proficiency in the English language must be provided according to § 3 para. 9 GER.
- (5) § 3 para. 12 GER applies for determining whether admission requirements are met.
- (6) General regulations on the recognition of prior examination performances are set out in § 13 GER.

§ 4 Standard Period of Study, Curriculum, Credit Points and Scope of Study

- (1) The standard period of study is four semesters (two years) full-time, including preparation of the Master's thesis. This degree program can only be commenced in the winter semester.
- (2) This study program consists of compulsory modules and compulsory elective modules, which are allocated to three compulsory areas and one compulsory elective area. The scope of the Master's thesis is 30 Credit Points. A total of 120 Credit Points must be acquired to successfully complete this program. The Master's examination is composed as follows:

Compulsory Courses Engineering	36 CP
Compulsory Elective Courses Engineering	12 CP
Compulsory Courses Management	40 CP
Compulsory Language Course	2 CP
Master's Thesis	30 CP
Sum	120 CP

- (3) The program comprises 20 modules including the Master's thesis module. All modules are defined in the module handbook. The weighting of examinations with Credit Points to be taken in the individual modules is carried out in compliance with § 4 para. 4 GER.
- (4) In administering this program, RWTH International Academy gGmbH ensures that the standard period of study can be adhered to, and that the modules required for a degree in particular and the corresponding examinations as well as the Master's thesis can be completed within the scheduled time frame and deadlines.

§ 5 Obligatory Attendance in Classes

- (1) According to § 5 para. 2 GER, obligatory attendance can only be stipulated in courses of the following type:
1. Tutorials
 2. Seminars
 3. Colloquia
 4. (Laboratory) practicals
 5. Simulation games
- (2) Courses for which attendance is compulsory according to para. 1, are identified as such in the module handbook.

§ 6 Examinations and Examination Deadlines

- (1) General regulations on examinations and examination periods are stipulated in § 6 GER.
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- (2) If the successful participation in modules or examinations or passing of module components according to § 5 para. 4 GER is stipulated as a precondition for participation in other examinations, this is indicated accordingly in the module handbook.

§ 7 Types of Examinations

- (1) General regulations on types of examination are stipulated in § 7 GER.
- (2) In accordance with § 7 para. 1 GER, the following other forms of examination are allowed:
1. In **simulation games**, students learn to implement the given company projects in teams (small groups) while assuming a defined assigned role. Simulation games can be computer-aided on the basis of programmed software or without such software. Students make active (managerial) decisions on the basis of defined rules and content discussed in the other modules, which are to be implemented in actions. Simulation games can be offered in cooperation with one or more university lecturers, or together with management practice. The latter may evaluate the results as a jury.
 2. For a **case study report**, the following applies specifically: in a project (Case Study), students should in a small group under tutelage independently work out the solution to a narrowly defined and practical problem and describe it in writing. The scope of the written description is at least 5 and at most 100 pages.
 3. Special didactical modules are project modules and can involve e.g. **case study work and case study discussions**, a **video interview** or a **video description** as examination. In project modules with special didactical formats, students learn to work together in teams and to successfully implement content covered in other modules. The focus of project modules with special didactical formats can either be on theory or on application. Topics and content of project modules may be defined on a semester-specific basis.
- (3) The duration of a written examination usually is...
- 60 to 90 minutes for up to 5 Credit Points awarded
 - 90 to 120 minutes for 6 or 7 Credit Points awarded
 - 120 minutes or more for 8 or more Credit Points awarded.
- (4) The duration of an oral examination is at least 15 minutes and at most 60 minutes per candidate for a module with up to 5 Credit Points. An oral examination as a group examination is carried out with no more than four candidates.
- (5) The following applies to seminar papers and term papers: the length of a written seminar paper or term paper is at least 10 and at most 100 pages. The time frame for completing a written seminar paper or term paper should be based on the scope of the Credit Points awarded (30 hours per Credit Point).
- (6) The scope of a written paper is at least 10 and at most 100 pages. The time frame for completing a written paper should be based on the scope of the Credit Points awarded (30 hours per Credit Point).
-

- (7) The following applies to project work in particular: in a project, students will in a small group under tutelage independently work out the solution to a narrowly defined, scientific problem, describe it in writing and present it. The scope of a written work is at least 10 and at most 100 pages. The duration of the presentation is at least 10 and at most 45 minutes. The time frame for completing project work should be based on the scope of the Credit Points awarded (30 hours per Credit Point).
- (8) The scope of a written preparation for a presentation is 5 to 10 pages. The duration of a presentation is at least 15 and at most 45 minutes.
- (9) The following applies to colloquia in particular: the duration of a colloquium is 10 minutes at least and 60 minutes at most.
- (10) At the start of the course in question, the examiner specifies the duration of the examination and, if applicable, other modalities of the examination.
- (11) Admission to module examinations may be conditional on the successful completion of module components as pre-examination within the meaning of § 7 para. 15 GER. For relevant modules, this will be outlined in the module handbook. At the start of the semester and no later than by the time of the first course session, the lecturer provides precise criteria in the CMS regarding possible improvement of grades through the completion of module components, particularly the amount and type of tutorials qualifying for bonus as well as the mode of correction and evaluation.

§8 Assessment and Grading

- (1) General regulations on assessing the examinations and the formation of grades are included in § 10 GER.
- (2) If an examination consists of several tests, each test must be passed, or have a grade of at least "sufficient" (4.0).
- (3) A module has been passed, if all associated examinations have been passed with a grade of at least "sufficient" (4.0), and all other Credit Points or module components have been achieved.
- (4) The overall grade is formed taking into account all module grades and the grade of the Master's thesis according to § 10 para. 10 GER.
- (5) In the case that all module examinations of the Master's degree program have been completed within the standard period of study, one weighted module grade corresponding to 5 Credit Points can be removed from the student's academic record according to § 10 para. 13 GER.

§9 Examination Board

The responsible Examination Board according to § 11 GER is the Master's Examination Board Business Administration and Engineering of the Faculty of Mechanical Engineering.

§10
**Repeating Examinations or the Master's Thesis and
the Loss of Right to Examination**

- (1) General regulations on repeat examinations, the Master's thesis, and the loss of right to examinations are stipulated in § 14 GER.
- (2) Freely selectable modules within an area of this Master's degree program (compulsory elective area) can be replaced upon application to the Examination Board as long as no examination has been taken and as long as it is permitted in the relevant module handbook. It is not possible to change compulsory modules.

§11
**Deregistration, Non-Attendance, Withdrawal,
Deception, Non-Compliance**

- (1) General provisions on deregistration, non-attendance, withdrawal, deception or noncompliance are stipulated in § 15 GER.
- (2) The following applies to deregister from practical work and seminars: deregistration from block courses is possible up to one day before the day of the first course.
- (3) With special didactical modules, a candidate may deregister an examination up to two weeks before the first relevant day of examination without stating reasons.

II. Master's Examination and Master's Thesis

§12
Type and Scope of the Master's Examination

- (1) The Master's examination consists of
 1. examinations that are to be completed based on the structure of the degree program according to § 4 para. 2 and detailed in the module handbook, as well as
 2. the Master's thesis and the Master's colloquium.
- (2) The order of courses is based on the curriculum (appendix 1). The assignment of the Master's thesis can only be issued if 80 Credit Points have been attained.

§13
Master's Thesis

- (1) General regulations on the Master's thesis are set out in § 17 GER.
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- (2) Regarding the supervision of the Master's thesis, reference is made to § 17 para. 2 GER.
- (3) The Master's thesis is written in the English language.
- (4) The time frame for students to complete their Master's thesis is usually at least 18 and at most 22 weeks alongside studies. In justified exceptional cases, the time frame can be extended by a maximum of up to six weeks upon application to the Examination Board in accordance with § 17 para. 7 GER. The scope of the written work should not exceed 80 pages without annexes.
- (5) The candidate presents the results of the Master's thesis as part of a Master's colloquium. § 7 para. 12 GER in connection with § 7 para. 8 apply accordingly. It is possible to hold the Master's colloquium before submission of the Master's thesis. The Master's colloquium must be held 4 weeks after submission of the written Master's thesis at the latest.
- (6) The workload for preparing and composing the Master's thesis as well as for the colloquium corresponds to 30 Credit Points. The grading of the Master's thesis can only be carried out after completion of the Master's colloquium.

§14

Acceptance and Assessment of the Master's Thesis

- (1) General provisions on acceptance and assessment of the Master's thesis are included in § 18 GER.
- (2) The Master's thesis must be submitted in due time in duplicate copies to the Central Examination Office (ZPA). The copies must be printed and bound. Additionally, the thesis must be submitted as a PDF file on a data storage device.

III. Final Provisions

§ 15

Viewing of Examination Files

Review of examination documents is carried out in accordance with § 22 GER.

§ 16

Coming into Effect, Publication and Transitional Provisions

- (1) These Examination Regulations will be published in the Official Announcements of RWTH Aachen University ("Amtliche Bekanntmachungen") and will come into effect on the day after their publication.
 - (2) These Examination Regulations apply to all students who enrolled in the Master's degree program Management and Engineering in Production Systems at RWTH for the first time in or after the Winter Semester 2020/2021.
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- (3) Students who enrolled in the Master's degree program Management and Engineering in Production Systems before the Winter Semester 2020/2021 may apply to transfer to the present Examination Regulations. The Examination Regulations dated June 20, 2013 in their currently valid version will apply to students until the Summer Semester 2023 at maximum. After the Summer Semester 2023 (September 30, 2023), it is mandatory to transfer to the present Examination Regulations.
- (4) Module components, which were completed before the Winter Semester 2020/2021, are valid for all examination attempts offered for a course.
- (5) Examinations completed based on the Examination Regulations dated June 20, 2013 in their second revised version dated September 25, 2014 in their valid version are transferred to the examinations required by the present Examination Regulations in accordance with the equivalence list in appendix 3.

Issued based on the resolutions of the Faculty Council of the Faculty of Mechanical Engineering dated March 3, 2020; September 29, 2020 and February 23, 2021.

It should be noted that, according to § 12, para. 5 of the law governing the universities of the Federal State of North Rhine-Westphalia (Higher Education Act - HEA), a violation of procedural or formal regulations of the regulatory law or other autonomous law of the university can no longer be asserted after the expiry of one year from the date of this announcement, unless

- 1) the regulations were not duly announced,
- 2) the rector's office has previously objected to the decision of the body deciding the regulations,
- 3) the university has been notified in advance of the formal or procedural defect, indicating the legal provision that has been violated and the fact that gives rise to the defect, or
- 4) the legal consequences of the exclusion of the right of appeals was not pointed out when the regulations were published.

The Rector
of RWTH Aachen University

Aachen, April 23, 2021

sgd. Rüdiger
Univ.-Prof. Dr. rer. nat. Dr. h. c. mult. U. Rüdiger

Appendix 1: Curriculum

MME-PS Curriculum		CP	WS - 1. Sem.			SS - 2. Sem.			WS - 3. Sem.			SS - 4. Sem.		
Module	CP		L	E	P	L	E	P	L	E	P	L	E	P
			SWS			SWS			SWS			SWS		
RWTH Aachen Engineering	Total Compulsory Courses - Engineering	36	21			15			0			0		
	Production Management A	5	2	2										
	Machine Tools	5	2	2										
	Quality Management	6	2	2										
	Manufacturing Technology I	5	2	2										
	Manufacturing Technology II	5				2	2							
	Production Management B	5				2	2							
	Industrial Logistics	5				2	1							
	Total Elective Courses - Engineering	12	3			4			5					
Total Courses - Management	40	5			10			25			0			
RWTH Aachen Management	Sustainable Development and the Global Economy	5	2	2										
	Finance and Accounting	5				2	2							
	Financial Management	5						2	2					
	Human Resource Management	5						2	2					
	Management Accounting	5						2	2					
	Strategic Management	5						2	2					
	Marketing Management	5				2	2							
	International Business	5						2	2					
	Language Course and Master Thesis	32	2			0			0			30		
Language Course	2	1	1											
Master Thesis	30												18-22 weeks	
Total CP	120	31			29			30			30			

Elective Courses	CP	L	E	Term
Simulation Techniques in Manufacturing Technology	6	2	1	WS
Industrial Engineering and Ergonomics	6	2	2	WS
Additive Manufacturing I	6	2	2	WS
Laser Applications	6	2	2	WS
Process Analysis in Manufacturing Technology	5	2	1	WS
Control Engineering	3	1	1	WS
Tribology	5	2	2	WS
Advanced Control Systems	4	2	1	WS
Model based Systems Engineering	6	2	3	WS
Computational Intelligence in Engineering	5	2	1	WS
Mechatronics and Control Techniques for Production Plants	6	2	2	WS
Robotic Systems	5	2	2	WS
Fundamentals in Light Weight Design	4	2	1	WS
Additive Manufacturing II	6	2	2	SS
Intelligent Monitoring of Engineering Systems	5	2	1	SS
Industrial product development process - battery systems for hybrid and electric vehicles	5	2	2	SS
Digital Health Engineering and Entrepreneurial Innovation	5	2	2	SS
Welding and Joining Technologies	6	2	2	SS
Factory Planning	6	2	2	SS
Advanced Electrical Drives	4	2	2	SS
Production Metrology	5	2	2	SS
Embedded Systems	6	3	1	SS
Battery Production	3	1	1	SS
Electric Mobility Components Production	3	1	1	SS
Production of Electric Drives	3	1	1	SS

L = Lecture E = Exercise P = Practical CP = Credit Points

Appendix 2: Objectives of this Master's degree program

This Master's degree program was designed as a postgraduate continuation of fundamental Bachelor degree programs in engineering, and aims at an in-depth, vocationally qualifying specialization in the field of Production Technology. At the same time, this Master's degree program takes into account the students' practical work experience. In addition, it conveys in-depth, theoretical and analytical knowledge regarding expertise and methods in engineering and economics. The program focusses on teaching competencies in the areas of application of production engineering. At the same time, it enables students to independently work scientifically and to develop a critical awareness of the complexity of the intersectional tasks of engineering and economic science.

After majoring in classical production technology, students have the option of taking electives in order to integrate their own interests into their studies. This ensures the individuality of the graduates and promotes the students' independence. The elective area allows students to distinguish themselves in one of three up-to-the-minute and industry-relevant specialization areas of production technology: Additive Manufacturing, Smart Factory or Electric Mobility Production. The focus hereby is on a research-oriented approaches to application-oriented tasks.

All in all, graduates acquire communicative skills and will be qualified to take on independent tasks related to research and management, as well as to act independently and responsibly. They understand the technical, economic and cultural challenges and areas of conflict in international contexts, are able to design projects in a solution-oriented and goal-oriented manner and to lead them to success. Additionally, graduates can constantly and independently update their knowledge and use it creatively to gain new insights and solve problems. They furthermore have the knowledge and skills to recognize new developments and technologies at an early stage as well as to evaluate their significance for the respective assignment. After completing this applied degree program, graduates are able to take on their first managerial functions with responsibility.

Appendix 3: Equivalence List

Master of Science in Management and Engineering in Production Systems (MME-PS) Äquivalenzliste Übergang PO 2013/064 zu PO 2020		
Module Prüfungsordnung 2013/064	CP	Module PO 2020
		CP
Pflichtbereich Engineering		Pflichtbereich Engineering
Manufacturing Technology I (P)	5	Manufacturing Technology I (P)
Production Management A (P)	5	Production Management A (P)
Quality Management (P)	6	Quality Management (P)
Machine Tools (P)	5	Machine Tools (P)
Industrial Engineering and Ergonomics (P)	6	Industrial Engineering and Ergonomics (WP)
Manufacturing Technology II (P)	5	Manufacturing Technology II (P)
Production Management B (P)	5	Production Management B (P)
Welding and Joining Technologies (P)	6	Welding and Joining Technologies (WP)
Industrial Logistics (P)	5	Industrial Logistics (P)
Pflichtbereich Management		Pflichtbereich Management
Entrepreneurial Strategy (P)	5	Strategic Management (P)
Innovation Management (P)	5	
Finance and Accounting (P)	5	Finance and Accounting (P)
Marketing Management (P)	5	Marketing Management (P)
International Project Management (P)	5	Financial Management (P)
Organizational Development and Change (P)	5	-
Economics for Managers (P)	5	Management Accounting (P)
International Business (P)	5	International Business (P)
Leadership and High Performance Teams (P)	5	Human Resource Management (P)
Responsible Supply Chain Management (P)	5	Sustainable Development and the Global Economy (P)
German Language Course (P)	2	Language Course (P)
		Wahlpflichtbereich Engineering
		Simulation Techniques in Manufacturing Technology (WP)
		Additive Manufacturing I (WP)
		Laser Applications (WP)
		Process Analysis in Manufacturing Technology (WP)
		Control Engineering (WP)
		Tribology (WP)
		Advanced Control Systems (WP)
		Model based Systems Engineering (WP)
		Computational Intelligence in Engineering (WP)
		Mechatronics and Control Techniques for Production Plants (WP)
		Robotic Systems (WP)
		Fundamentals in Light Weight Design (WP)
		Additive Manufacturing II (WP)
		Intelligent Monitoring of Engineering Systems (WP)
		Industrial product development process - battery systems for hybrid and electric vehicles (WP)
		Factory Planning (WP)
		Advanced Electrical Drives (WP)
		Production Metrology (WP)
		Embedded Systems (WP)
		Battery Production (WP)
		Electric Mobility Components Production (WP)
		Production of Electric Drives (WP)
		Digital Health Engineering and Entrepreneurial Innovation
Master Thesis (P)	20	Master Thesis (P)