

**Course of Study-Specific Examination Regulations
for the Master's Course of Study
in Sustainable Management – Water and Energy
of RWTH Aachen University
Dated September 14, 2017,
in the 4th Revised Version**

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Please note: This publication is an English translation. Only the German original of these regulations as published in the Official Announcements of RWTH Aachen University (“Amtliche Bekanntmachungen”) is legally binding.

On the basis of §§ 2 (4) (64) of the law governing the Universities of the Federal State of North Rhine-Westphalia (or Hochschulgesetz – HG) in the version of the act dated September 16, 2014 (Law and Official Gazette of the State of North Rhine-Westphalia p. 547), last amended by the Act to Amend the Higher Education Act and the Art School Act dated November 25, 2021 (Law and Official Gazette NRW p. 1210a), RWTH Aachen University (RWTH) has issued the following examination regulations:

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I. General

§ 1

Scope of Application and Academic Degree

- (1) These examination regulations apply to the Sustainable Management – Water and Energy Master's course of study at RWTH. They only apply in conjunction with the currently valid version of the General Examination Regulations (GER) in the relevant applicable version, supplementing it with an additional set of course-specific regulations. In cases of doubt, the provisions of the General Examination Regulations take priority.
- (2) Upon successful completion of the Master's program, the Faculty of Civil Engineering awards the academic degree of Master of Science RWTH Aachen University (M. Sc. RWTH)

§ 2

Objectives of the Course of Study and Language Provisions

- (1) This is a Master's course of study pursuant to § 2 (3) GER (Master's degree program building on a Bachelor's degree). The course of study builds on the Bachelor's degree in civil engineering or environmental engineering at RWTH.
- (2) The overall educational objectives are set out in § 2 (1) (3) (4) GER. For further information and provisions on the objectives of this Master's course, please refer to Appendix 3 of the present Examination Regulations.
- (3) The degree program is taught in English.

§ 3

Admission Requirements

- (1) A basic requirement for admission is a recognized university degree according to § 3 (4) GER.
- (2) To meet the educational prerequisites and successfully complete the Master Sustainable Management – Water and Energy course of study, applicants must have the necessary knowledge and skills in the following areas:
 - A total of at least 19 CP in the fundamentals of natural sciences in at least three out of six areas:
 - Mathematics
 - Statistics
 - Chemistry
 - Physics
 - Ecology
 - Computer Science

- Foundational knowledge in engineering and hydraulic engineering totaling at least 20 CP in at least three of the four following areas:
 - Mechanics
 - Hydromechanics
 - Hydraulic Engineering/River Engineering
 - Thermal Engineering
- A total of at least 20 CP from at least three areas of subject-specific fundamentals (at least 3 of 11):
 - Process Engineering
 - Power Engineering
 - Water Management
 - Fuels/Energy Sources
 - Business Administration
 - Climatology
 - Hydrology
 - Environmental Management
 - Power Economics
 - Residential Water Management
 - Surveying

The credit points must have been gained for assessments comparable to those required by the Civil Engineering or Environmental Engineering Bachelor's courses of study offered by RWTH.

In addition, all applicants are required to provide evidence of completion of the Graduate Record Examination (GRE) General Test. Applicants who are citizens of a member state of the European Union or of the European Economic Area (EEA) as well as "Bildungsinländerinnen" or "Bildungsinländer", i.e. non-German citizens who have a school leaving certificate or university degree that is recognized by German Law are exempt from this rule.

- (3) For admission conditional on the completion of additional requirements, § 3 (6) GER applies. If additional requirements corresponding to more than 20 credit points are imposed, admission to the Master's course of study will be denied.
- (4) For this Master's course of study, sufficient knowledge of the English language must be proven according to § 3 (9) GER.
- (5) § 3 (12) GER applies for determining whether the admission requirements are met.
- (6) General regulations for the recognition of prior assessments and exams are stipulated 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. Students can usually only begin their studies in the winter semester.
- (2) The course of study consists of a mandatory and a required electives component. For successful completion of the degree program, a total of 120 credit points must be acquired. The Master's examination is comprised of the following components:

Mandatory modules (Including the "Mobility Window" module in the scope of 30 CP)	47 CP
Core elective modules	43 CP
Master's thesis	30 CP
Total	120 CP

- (3) The degree course comprises between 15 and 18 modules, including the "Master's thesis" and "Mobility Window" modules. All modules are specified in the module catalog. The weighting of the examinations with credit points to be taken in the individual modules is carried out according to § 4 (4) GER.
- (4) The program stipulates a compulsory semester abroad in the third semester. The exams taken at the partner universities will be recognized for the "Mobility Window" module in accordance with § 13 GER in conjunction with § 3 (6). The examination achievements planned abroad and their recognition for the module "Mobility Window" are recorded in a learning agreement between the three parties involved (student, partner university, and RWTH) before the start of the semester abroad. Students are required to provide the relevant examination board in advance with information on planned assessments to be taken during study abroad as a basis for the conclusion of the Learning Agreement. In exceptional cases, the responsible examination board may, upon justified application by the student, waive the compulsory semester abroad in whole or in part if the student or the student's next of kin is subject to a serious mobility restriction. If this exception is granted, the student will have to gain an equivalent number of credit points through substitute assessments.

§ 5

Obligatory Attendance in Classes

- (1) According to § 5 (2) GER, obligatory attendance can only be stipulated in courses of the following type:
1. Tutorials
 2. Seminars and introductory seminars ("Proseminare")
 3. Colloquia
 4. Lab courses
 5. Excursions
 6. Projects
 7. Business games
- (2) Classes, for which attendance is required in accordance with paragraph 1, shall be identified as such in the module catalog.

§ 6

Examinations and Examination Deadlines

- (1) General regulations on exams and exam periods are stipulated in § 6 GER.
- (2) Provided that completion of modules, exams, or module components according to § 5 (4) GER is stipulated as a precondition for participation in other exams, this is indicated in the module catalog.

§ 7 Types of Examinations

- (1) General regulations on types of examination are included in § 7 GER.
- (2) The duration of an exam is as follows:
 - 60 to 120 minutes for up to 5 CP
 - 120+ minutes for 6 or more CP
- (3) The duration of the oral exam shall be least 15 minutes and a maximum of 60 minutes. An oral exam may be carried out as a group exam with up to four candidates.
- (4) Term seminar papers range from 1 and maximum of 100 pages. The processing time of a seminar papers should be based on the scope of the CP (30 hours per CP).
- (5) Term papers range from 1 and maximum of 100 pages. The processing time of a written term paper should be based on the scope of the CP (30 hours per CP).
- (6) Term project work range from 1 and maximum of 100 pages. The processing time of a written term project work should be based on the scope of the CP (30 hours per CP).
- (7) The written version of the **oral presentation** shall range from 1 to 100 pages. The duration of the presentation shall be least 10 minutes and a maximum of 60 minutes.
- (8) For colloquia, the following applies in detail: the duration of the discussion with the examiner and other participants of the colloquium is at least 10 and at most 60 minutes.
- (9) The examiner specifies the duration of the examination and, if applicable, other modalities of the examination at the start of the course.
- (10) Admission to module examinations may be conditional on the successful completion of module components as examination requirements in accordance with § 7 (15) GER. For the relevant modules, this is outlined in the module catalog. At the start of term, or by the time of the first course session, the lecturer shall provide precise criteria in the Campus Management System regarding possible improvement of grades through the completion of module components, particularly the number and type of tutorials that can be taken for extra credit as well as the mode of correction and assessment.

§ 8 Assessment and Grading

- (1) General regulations for assessing the exams and the formation of grades are stipulated in § 10 GER.
- (2) If an examination consists of several partial exams, each partial exam must be passed, i.e. be completed with the grade of at least "sufficient" (4.0).
- (3) A module has been passed if all associated partial exams have been passed with a grade of at least "sufficient" (4.0), and all other credit points or module components have been achieved according to the relevant course of study-specific examination regulations.

- (4) The overall grade is formed taking into account all module grades and the grade of the Master's thesis according to § 10 (10) GER.

§ 9 Examination Board

The responsible examination board according to § 11 GER is the Master Examination Board Sustainable Management - Water and Energy of the Faculty of Civil Engineering.

§ 10 Repeating Examinations or the Master's Thesis, Loss of the Right to Take an Exam

- (1) General regulations governing retaking exams or the Master's thesis, and the loss of the right to take exams are stipulated in § 14 GER.
- (2) Modules that can be freely selected within an elective area of this Master's course can be replaced, provided this is permitted according to the module catalog. It is not possible to replace mandatory modules.

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

- (1) General provisions on deregistration, non-attendance, withdrawal, deception, or non-compliance are included in § 15 GER.
- (2) The following applies to the deregistration from lab courses and seminars: deregistration from block courses is possible until one day before the first day of the course.

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 course of study according to § 4 (2) and detailed in the module catalog, as well as
 2. the Master's thesis and the Master's final colloquium.
- (2) The order of courses is based on the curriculum (Appendix 1). The Master's thesis can only be registered once the student has attained 60 credit points.

§ 13 Master's Thesis

- (1) General provisions for the Master's thesis are stipulated in § 17 GER.
- (2) Further details regarding the supervision of the Master's thesis are outlined in § 17 (2) GER.
- (3) The Master's thesis is to be written in the English language.
- (4) The working time for the Master's thesis is usually six months at maximum alongside studies. In justified exceptional cases, the writing-up time can be extended by a maximum of up to six weeks upon application to the relevant examination board in accordance with § 17 (7) GER.
- (5) The written work should not exceed 80 pages, excluding appendices.
- (6) The candidate presents the results of the Master's thesis as part of a Master final colloquium. § 7 (12) GER in connection with § 7 (8) apply accordingly. It is possible to hold the Master's final colloquium before submission of the Master's thesis.
- (7) The work required for preparing and writing the Master's thesis as well as for the colloquium shall correspond to 30 credit points. The Master's thesis can only be graded after the Master's final colloquium has taken place.

§ 14 Acceptance and Assessment of the Master's Thesis

- (1) General provisions on the acceptance and assessment of the Master's thesis are stipulated in § 18 GER.
- (2) Two copies of the Master's thesis are to be submitted on time, printed and bound, to the Central Examination Office. Printed, bound copies are to be submitted. Furthermore, the thesis must be submitted as a PDF file on a data carrier.

III. Final Provisions

§ 15 Viewing of Examination Records

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

§ 16 Entry into Force, Publication, and Transitional Provisions

- (1) These regulations shall be published in the official announcements of RWTH Aachen University ("Amtliche Bekanntmachungen") and shall enter into force as of the 2022/2023 winter semester.

- (2) These examination regulations apply to all students enrolled in the Master's degree program Sustainable Management – Water and Energy

Issued on the basis of the resolutions of the Faculty Council of the Faculty of Civil Engineering from July 12, 2017; November 7, 2018; November 13, 2019; November 11, 2020; and February 2, 2022.

It is pointed out that, in accordance with § 12 (5) NRW HG, any claims regarding a violation of procedural or formal requirements of the regulatory or other autonomous rights of the University may no longer be asserted after one year has elapsed since the official publication of this announcement unless:

- 1) the announcement has not been properly published,
- 2) the Rectorate has objected, prior to publication, to the decision of the committee adopting the regulations,
- 3) the University has been previously notified about the defect of form or of procedure in a complaint, specifying the infringed legal provision and the fact which gives rise to the defect, or
- 4) the legal consequence of the exclusion of complaints was not pointed out in the public announcement.

The Rector
of RWTH
Aachen University

Aachen,
dated

April 07, 2022

sgd. Rüdiger

Univ.-Prof. Dr. rer. nat. Dr. h. c. mult. Ulrich Rüdiger

Appendix 1: Curriculum (valid from summer semester 2022)

Module	Course	1. Sem.		2. Sem.		3. Sem.		4. Sem.	
		WiSe		SoSe		WiSe		SoSe	
		SWS	CP	SWS	CP	SWS	CP	SWS	CP
Compulsory Modules									47 CP
Global Changes and Sustainable Development	Global Changes and Sustainable Development	2	4						
Expanding Engineering Limits: Culture, Diversity and Gender - Lecture Part	Expanding Engineering Limits: Culture, Diversity and Gender - Lecture Part	2	4						
Engineering Hydrology	Engineering Hydrology			2	5				
Water-Energy-Food Nexus	Water-Energy-Food Nexus			2	4				
Mobility Window*							30		

*The study program provides for a mandatory semester abroad in the third semester. The examination results obtained at the partner universities are recognized for the module "Mobility Window" in accordance with § 13 of the General Examination Regulations in conjunction with § 3 para. 6.

Compulsory Elective Modules	43 CP
> For modules see Curriculum Support and the website of the Faculty of Civil Engineering.	
The completion of these modules is recommended in the first two semesters, because a semester abroad is planned in the third semester and the master's thesis in the fourth semester.	

Master's Thesis	30 CP
Recommended in the 4th semester.	

WiSe = Winter Term SoSe = Summer Term SWS = Contact Hours per Week CP = Credit Points
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Total: 120 CP

Appendix 2: Program-Specific Educational Objectives

To secure the supply of water and energy in the long term is one of the great global challenges of our time. In this context, the cross-sector water-energy nexus is becoming increasingly important. Due to the complex interrelationships between water and energy supply and distribution as important pillars of sustainability, it becomes increasingly important to integrate different scientific perspectives. By providing insights into complex interdependencies – detached from individual resources – the water-energy nexus gains in importance as a key element of sustainable development.

With the Master's degree program in Sustainable Management, RWTH meets this demand for interdisciplinary collaboration. The program integrates disciplines from energy engineering, civil engineering, environmental engineering, geography, as well as economics and social sciences. It equips students with specialized analytical, methodological, problem-solving, and assessment skills in the areas of water and energy management. In addition, it teaches interdisciplinary competencies, such as the ability to critically reflect on innovations in a global context and the ability to work independently in a scientific and research-based manner. The fixed mobility window in the third semester as well as the integration of Massive Open Online Courses in the curriculum help students develop intercultural competencies and enhance their international outlook on the topics of water and energy supply.

The broad range of skills taught enables graduates to deal with complex global challenges of great scientific, technological and social relevance in their professional lives. The program aims to create a new generation of socially responsible engineers who will help shape global sustainable development. Due to their interdisciplinary and internationally-oriented education, graduates of the Sustainable Management program are able to deal with and evaluate complex global interrelationships between energy economics and water supply. With their skills profile, they have career opportunities in the water and energy industries and in consulting engineering firms or in public administrations at the state, federal or European level.

In addition, there is great demand for suitably qualified specialists in non-governmental organizations or international organizations such as the United Nations, the World Bank, or the Society for International Cooperation. Graduates can also work as researchers and science managers at the intersection of different disciplines.