

Examination Regulations

for

Mechatronic Systems Engineering B.Sc.

at Rhine-Waal University of Applied Sciences

Dated 29 August 2013

*Please note: this English translation is provided for information purposes only.
Only the German version published in the Official Notices of Rhine-Waal University of Applied Sciences is legally binding.*

In accordance with Section 2 (4) sentence 1 and Section 64 (1) of the Higher Education Act of North Rhine-Westphalia [Hochschulgesetz – HG NRW], in the amended form produced by the Greater Liberty for Higher Education Institutions Act [Hochschulfreiheitsgesetz] of 31 October 2006 (Law and Regulations Gazette of NRW – GV.NRW. 2006, p. 474), last amended by Article 6 of the Recognition Act of North Rhine-Westphalia [Anerkennungsgesetz Nordrhein-Westfalen] of 28 May 2013 (GV.NRW. 2013, p. 272), and in accordance with the General Examination Regulations for Bachelor's Programmes [Rahmenprüfungsordnung – RPO] of Rhine-Waal University of Applied Sciences of 22 October 2012 (Official Notice 11/2012, published 29 October 2012), as amended by the First Amending Statutes of 6 August 2013 (Official Notice 32/2013, published 19 September 2013), the Faculty Council of the Faculty of Technology and Bionics at Rhine-Waal University of Applied Sciences has issued the following examination regulations:

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Section 1

Scope of application

These examination regulations shall apply to the English-taught bachelor's degree programme Mechatronic Systems Engineering of the Faculty of Technology and Bionics of Rhine-Waal University of Applied Sciences, in conjunction with the General Examination Regulations for Bachelor's Programmes [Rahmenprüfungsordnung; hereinafter "RPO"] of Rhine-Waal University of Applied Sciences. These examination regulations govern both the standard seven-semester mode of study (full-time study) and the nine-semester dual-vocational mode of study (dual study).

Section 2

Aims and objectives; purpose of examination; degree awarded

(1) The bachelor's examination concludes the degree programme and constitutes a first academic and scientific qualification towards a career. The aims and objectives for bachelor's programmes are outlined in Section 3 RPO. A strong command of the English language is key to achieving success in this degree programme, as it provides the essential basis for this programme's continuous goal of broadening and deepening students' technical language and communication skills.

(2) The academic degree "Bachelor of Science", abbreviated as "B.Sc.", shall be awarded for the successful completion of the bachelor's examination.

Section 3

Entry requirements

(1) The general entry requirements for bachelor's degree programmes are outlined in Section 4 RPO.

(2) Admission to the dual study programme requires a signed and valid vocational training contract with a German company in a field related to the programme of study.

(3) A "related or comparable programme of study" within the meaning of Section 4 (6) RPO is defined as any undergraduate (bachelor's or German 'Diplom') degree programme at a university or university of applied sciences in Germany if that programme's content predominately falls under the umbrellas of mechatronics, mechanical engineering or electrical engineering.

(4) Sufficient proficiency in English can be demonstrated by submitting a valid and recognised language certificate equivalent to CEFR level B2 (Common European Framework of Reference for Languages).

(5) Exempted from this language certificate requirement are applicants who have acquired English language abilities equivalent to level B2 over the course of earning their university entrance qualification [Hochschulreife] at a secondary school in Germany. This is considered the case when an applicant has successfully completed at least seven years of English at a German secondary school and earned a final cumulative mark of at least "sufficient" (4.0 or better) for the subject.

Section 4

Preparatory internship

Students in this degree programme are required to complete an eight-week preparatory internship (within the meaning of Section 4 (3) RPO) at an extramural company, public authority, organisation (for-profit or nonprofit) or other institution and in a context relevant to the curriculum. The internship should familiarise the student with questions and matters relating to engineering, business administration and organisation.

Section 5

Programme structure; volume of studies; progression of studies

(1) This degree programme has a total volume of study of 139 credit hours [Semesterwochenstunden – SWS].

(2) In accordance with the framework described in Section 6 (5) RPO, the modules of this programme comprise a total sum of 210 credit points (hereinafter “CP”).

(3) An integral part of the dual study programme is on-the-job vocational training that occurs over the first four semesters of study and is subject to contractual agreement between the student and the company providing the training. Both the vocational training position and the company must have a clear relevance to the student’s chosen field of study. The Faculty of Technology and Bionics shall be responsible for assessing the relevance of a proposed dual study contract. In the ‘dual phase’ of study, the regular content of the first two semesters is taught over the course of four semesters instead. During this phase, the dual study student spends two weekdays studying at the university and three weekdays receiving vocational training at the company. The dual phase concludes with a comprehensive examination, in German, conducted by the respective German Chamber of Industry and Commerce before the start of the fifth semester. From this point the student begins to study full time and completes the remaining degree requirements.

(4) Additional information about the structure and progression of the programme, as well as about the type, form and scope of modules, can be found in the study and examination schedule in the annex of these examination regulations. For additional information about a module’s qualification aims, content and most commonly offered mode of examination, please refer to the descriptions in the Handbook of Modules, which is available in the dean’s office for all students and staff to review.

Section 5a

Practical semester; study abroad semester

(1) In accordance with Section 21 (4) sentence 4 RPO, the option of receiving faculty support in securing a work placement (Section 21 (4) sentence 1 RPO) as well as the option of undertaking an applied research project at the university instead of a work placement (Section 21 (4) sentences 2 and 3) are excluded for students of this programme.

(2) In accordance with Section 22 (8) RPO, the option of undertaking a study abroad semester (Section 22 RPO) is excluded for students of this programme.

Section 6
Scope of examinations

- (1) The time allotted to students for a written examination is based on the CP value of the respective course unit(s). As a general rule, 30 minutes shall be allotted for every one CP, not to exceed two hours in total.
- (2) An oral examination generally lasts at least 30 minutes, but no more than 45 minutes.
- (3) The text portion of an assignment, term paper or project should not exceed 30 DIN A4 pages in length (not including annexes).

Section 7
Scope and form of the bachelor's thesis

- (1) As a rule, the text portion of the bachelor's thesis should be between 50 and 100 DIN A4 pages in length (not including annexes). The thesis may also be supplemented with other media, provided they are appropriate and helpful for the documentation of the thesis in accordance with the assigned task. In this case the text portion of the thesis (not including annexes) may have less pages than the minimum requirement defined in sentence 1.
- (2) The bachelor's thesis can also be admitted as group work if each student's individual contribution fulfils the requirements in Section 23 (1) RPO and is clearly distinguishable and thus assessable due to clear delimitation by section, page numbers or other criteria that ensure distinct identification of each student's separate contribution.

Section 8
Admission to the bachelor's thesis and colloquium

- (1) In conjunction with the general prerequisites for admission to a bachelor's thesis (Section 24 (1) RPO), candidates must show that they have acquired 175 CP.
- (2) In conjunction with the general prerequisites for admission to a colloquium (Section 27 (2) RPO), candidates must show that they have acquired 207 CP.

Section 9
Credit points for the bachelor's thesis and colloquium

- (1) Twelve CP shall be awarded for successfully passing the bachelor's thesis.
- (2) Three CP shall be awarded for successfully passing the colloquium.

Section 10
Conferment of the bachelor's degree

The bachelor's degree specified in Section 2 (2) is officially conferred with the issuing of the bachelor's degree certificate (Section 30 (1) RPO).

Section 11
Entry into force

These examination regulations shall enter into force on the day after their publication in the Official Notices [Amtliche Bekanntmachungen] of Rhine-Waal University of Applied Sciences.

Note: These examination regulations entered into force on 26 September 2013.

Appendix I: Recommended study and examination schedule for Mechatronics Systems Engineering B.Sc. (full-time, 7 semesters)

Code-Nr.	Module /Subjects	CH	LTP						Prüf.	Summ CP	WS1	SS2	WS3	SS4	WS5	SS6	WS7
			V	SL	S	Ü	Pra	Pro									
SE_1	Naturwissenschaftliche Grundlagen Fundamentals of Natural Sciences																
SE_1.1	Grundlagen der Physik Fundamentals of Physics	3	2				1		P	6	3						
SE_1.2	Grundlagen der Chemie Fundamentals of Chemistry	3	2				1				3						
SE_1.3	Naturwissenschaftliches Labor Natural Science Laboratory	2						2	T		2						
SE_2	Mathematik und IT Mathematics and IT																
SE_2.1	Einführung Mathematik Introductory Mathematics	4	2				2		P	5	4						
SE_2.2	Computergestützte Berechnungs-Werkzeuge Computer based Engineering Tools	2						2	T		2						
SE_3	Statik und Elektrotechnik Statics and Electrical Engineering																
SE_3.1	Statik Statics	3	2				1		P	5	3						
SE_3.2	Elektrotechnik Electrical Engineering	3	2					1	T		3						
SE_4	Kreativität und Konfliktmanagement Creativity and Conflict Management																
SE_4.1	Konfliktmanagement Conflict Management	2	1				1		T	5	2						
SE_4.2	Kreativitätslehre Creativity	2	1				1		T		2						
SE_5	Technische Darstellung Technical Drawing	4	2					2	T	5	4						
SE_6	Interkulturelles Projektmanagement Cross-cultural Project Management																
SE_6.1	interkulturelles Management Cross-cultural Management	2	2						T	5	2						
SE_6.2	Projektmanagement Project Management	2	1				1		T			2					
SE_7	Werkstoffe und Werkstoffprüfung Materials and Testing	4	2				1	1	P	5	4						
SE_8	Mathematik Applied Mathematics	4	2				2		P	5	4						
SE_9	Elastostatik und Elektronik Elasto-Statics and Electronics																
SE_9.1	Elastostatik Elastostatics	3	2				1		P	5	3						
SE_9.2	Elektronik Electronics	3	2				1				3						
SE_10	IT-Programmierung IT-Programming	4	2					2	T	5	4						
SE_11	Konstruktionslehre Technical Design	4	2				2		P	5	4						
SE_12	Thermodynamik Thermodynamics	4	2				1	1	P	5	4						
SE_13	Fertigung und Qualität Manufacturing and Quality																
SE_13.1	Fertigungstechnik Manufacturing Technology	3	2					1	P	5		3					
SE_13.2	Integrierte Management-Systeme Integrated Management Systems	3	2				1					3					
SE_14	Dynamik und Statistik Dynamics and Statistics																
SE_14.1	Dynamik Dynamics	4	2				2		P	5		4					
SE_14.2	Numerik und Statistik Numerics and Statistics	3	2				1					3					
SE_15	Grundlagen der Verfahrenstechnik Fundamentals of Process Engineering	4	2				1	1	P	5		4					
SE_16	Leistungselektronik und Antriebe Power Electronics and Drives	4	2				2		P	5		4					
SE_17	Projekt I Project I	4							4	T	6			4			
SE_21	Mechatronik Mechatronics																
SE_21.1	Mechatronik Mechatronics	2	2						P	5		2					
SE_21.2	Sensoren und Aktoren Sensors and Actuators	2	1				1					2					
SE_21.3	Bussysteme Bus Systems	2	2									2					
SE_18	Betriebswirtschaftslehre Business Economics																
SE_18.1	Investition, Finanzierung und Controlling Investment, Financing, and Controlling	2	2						P	5				2			
SE_18.2	BWL und Marketing Business Economics and Marketing	2	2										2				
SE_19	Modellbildung und Simulation Modelling and Simulation	4	2				2		P	5			4				
SE_20	Mess- und Regelungstechnik Measurement Engineering and Controls	4	2				2		P	5			4				

Praxissemester / Internship (30 CP)

Workshop 1: Abschlussarbeit / Final Thesis (6 CP)
Workshop 2: Wissenschaftliche Methoden / Scientific Methods (6 CP)
Bachelor - Arbeit / Bachelor Thesis (3 Monate - 12 CP)
Kolloquium / Colloquium (3 CP)

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SE_22	Objektorientierte Software-Entwicklung Object-oriented Software Development	4	2				2		T	5					4		
SE_23	Steuer- und Regelungstechnik Control Engineering																
SE_23.1	Steuerungs- und Regelungstechnik Controls	4	2			1	1		P	5							4
SE_23.2	Mikroelektronische Steuerungen Microelectronic Control Systems	2	1				1		T								2
SE_24	Robotik und Assistenzsysteme Robotics and Assistance Systems	4	2			1	1		P	5							4
SE_25	Innovation und Unternehmertum Innovation and Entrepreneurship																
SE_25.1	Innovationsmanagement Innovation Management	2	2						T	5							2
SE_25.2	Unternehmertum Entrepreneurship	2	1				1		T								2
SE_26	Projekt II Project II	4						4	T	6							4
SE_27	Wahlpflichtkatalog / Electives * ** ***	16									20				8	8	
	Semesterwochenstunden credit hours per week	139									153	30	28	31	24	26	30 27

Code-Nr.	Wahlpflichtkatalog/Electives * ** ***	SWS	CP	Prüf.
SE_27.1	Mobilhydraulik Mobile Hydraulics	3	4	P
SE_27.2	Landmaschinenertechnik Agricultural Machinery	2	2	P
SE_27.3	Fahrzeugtechnik Vehicle Technology	3	4	P
SE_27.4	Mehrkörperdynamik Multibody Dynamics	3	4	P
SE_27.5	Steuerung verfahrenstechnischer Anlagen Control of Plants in Process Engineering	2	2	P
SE_27.6	Spezielle Sensoren und Aktoren Special Sensors and Actuators	2	2	P
SE_27.7	Optische Systeme in der Mechatronik Optical Systems in Mechatronics	4	5	P
SE_27.8	Finite Elemente Berechnungen Finite Elements Analysis	4	5	P
SE_27.9	Wahlmöglichkeit Angebot HRW Module from any other study course URW	6	8	P

WS = winter semester

SWS= Semesterwochenstunden, *credit hours per week*

SS = summer semester

P = Prüfung, *examination*

Prüf. = Art der Prüfung, *type of examination*

T = Testat, *certificate*

CP = credit points (= ECTS-points)

V = Vorlesung, *lecture*

SL = seminaristischer Unterricht, *seminar-like classes*

S = Seminar, *seminar*

Ü = Übung, *exercise*

Pra = Praktikum, *practical training*

Pro = Projekt, *project*

* Im Wahlpflichtbereich können mit Zustimmung des Prüfungsausschusses maximal 8 CP aus dem gesamten Studienangebot der Hochschule Rhein-Waal belegt werden. / * As elective subjects, a maximum of 8 CP can be chosen with the consent of the examination committee from any study programme at the Rhine-Waal University of Applied Sciences.

** Die Fakultät behält sich das Recht vor eine Mindestteilnehmerzahl für das Zustandekommen eines Wahlpflichtkurses festzulegen. Die Möglichkeit des Erreichens der vorgeschriebenen Kreditpunktzahl aus dem Wahlpflichtbereich bleibt unberührt. / ** The faculty reserves the right to determine a minimum number of participants for offering an elective subject. The possibility to obtain the required number of credit points remains unaffected.

*** Die Fakultät behält sich vor, dass Wahlpflichtangebot im Laufe der Zeit bei neuen Entwicklungen in verschiedenen Feldern der Mechatronik durch weitere Fächer zu erweitern.

*** The faculty reserves the right to offer additional elective subjects according to new developments in the various fields of mechatronics.

Appendix II: Recommended study and examination schedule for Mechatronic Systems Engineering B.Sc. (dual, 9 semesters)

													WS1		SS2								
													WS1a	WS1b	SS2a	SS2b	WS3	SS4	WS5	SS6	WS7		
Semesterzuordnung im Vergleich zum Vollstudium / Content of first two semester (full-time) taught over four semesters																							
Mechatronic Systems Engineering (dual)																							
Code-Nr.	Module /Subjects	CH	Typ						Prü	CP	Sum CP	WS1	WS3	SS2	SS4	WS5	SS6	WS7	SS8	WS9			
			V	SL	S	Ü	Pra	Pro															
SE_1	Naturwissenschaftliche Grundlagen Fundamentals of Natural Science																						
SE_1.1	Grundlagen der Physik Fundamentals of Physics	3	2			1			P	2	6		3										
SE_1.2	Grundlagen der Chemie Fundamentals of Chemistry	3	2			1				2		3											
SE_1.3	Naturwissenschaftliches Labor Natural Science Laboratory	2						2	T	2		2											
SE_2	Mathematik und IT Mathematics and IT																						
SE_2.1	Einführung Mathematik Introductory Mathematics	4	2			2			P	3	5	4											
SE_2.2	Computergestützte Berechnungs-Werkzeuge Computer based Engineering Tools	2						2	T	2		2											
SE_3	Statik und Elektrotechnik Statics and Electrical Engineering																						
SE_3.1	Statik Statics	3	2			1			P	3	5	3											
SE_3.2	Elektrotechnik Electrical engineering	3	2					1	T	2		3											
SE_4	Kreativität und Konfliktmanagement Creativity and Conflict Management																						
SE_4.1	Konfliktmanagement Conflict Management	2	1			1			T	2	5		2										
SE_4.2	Kreativitätslehre Creativity	2	1			1				3			2										
SE_5	Technische Darstellung Technical Drawing	4	2					2	T	5	5	4											
SE_6	Interkulturelles Projektmanagement Cross-Cultural Project Management																						
SE_6.1	Interkulturelles Management Cross-cultural Management	2	2						T	2	5		2										
SE_6.2	Projektmanagement Project Management	2	1			1				3				2									
SE_7	Werkstoffe und Werkstoffprüfung Materials and Testing	4	2					2	P	5	5				4								
SE_8	Angewandte Mathematik Applied Mathematics	4	2			2			P	5	5			4									
SE_9	Elastostatik und Elektronik Elastostatics and Electronics																						
SE_9.1	Elasto-Statik Elastostatics	3	2			1			P	3	5			3									
SE_9.2	Elektronik Electronics	3	2			1				2			3										
SE_10	IT-Programmierung IT-Programming	4	2					2	T	5	5			4									
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SE_12	Thermodynamik Thermodynamics	4	2			1	1		P	5	5				4								
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SE_14.1	Dynamik Dynamics	4	2			2			P	3	5				4								
SE_14.2	Numerik und Statistik Numerics and Statistics	3	2			1				2				3									
SE_15	Grundlagen der Verfahrenstechnik Fundamentals of Process Engineering	4	2			1	1		P	5	5				4								
SE_16	Leistungselektronik und Antriebe Power Electronics and Drives	4	2			2			P	5	5				4								
SE_17	Projekt I Project I	4						4	T	6	6				4								
SE_21	Mechatronik Mechatronics																						
SE_21.1	Mechatronik Mechatronics	2	2						P	2	5				2								
SE_21.2	Sensorik und Aktorik Sensors and Actuators	2	1			1				2				2									
SE_21.3	Busssysteme Bus Systems	2	2							1				2									
SE_18	Betriebswirtschaftslehre Business Economics																						
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SE_28: Praxissemester / Internship (30 CP)

SE_28 Workshop 1: Abschlussarbeit / Final Thesis (6 CP)

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SE_31 Bachelor - Arbeit / Bachelor Thesis (3 Monate - 12 CP)

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SE_23	Steuer- und Regelungstechnik Control Engineering																		
SE_23.1	Steuerungs- und Regelungstechnik Controls	4	2			1	1		P	3	5								4
SE_23.2	Mikroelektronische Steuerungen Microelectronic Control Systems	2	1				1		T	2									2
SE_24	Robotik und Assistenzsysteme Robotics and Assistance Systems	4	2			1	1		P	5	5								4
SE_25	Innovation und Unternehmertum Innovation and Entrepreneurship																		
SE_25.1	Innovationsmanagement Innovation Management	2	2						T	3	5								2
SE_25.2	Unternehmertum Entrepreneurship	2	1				1		T	2									2
SE_26	Projekt II Projekt II	4						4	T	6	6								4
SE_27	Wahlpflichtkatalog / Electives * * * * *	16								20	20					8	8	8	8
	Semesterwochenstunden credit hours per week	139								153	153	16	14	14	22	39	30	27	

Code-Nr.	Wahlpflichtkatalog/Electives * * * * *	SWS	CP	Prü
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