HOCHSCHULE RHEIN-WAAL
Rhine-Waal University of Applied Sciences

Examination Regulations

Mechatronic Systems Engineering B.Sc.

Faculty of Technology and Bionics

Rhine-Waal University of Applied Sciences

Dated 9 January 2018
(Official Notice 17/2018)

as amended by the second amending statutes from 19 August 2020
(Official Notice 1/2021)

Contents

Section 1
Scope

These Examination Regulations apply to the undergraduate degree programme Mechatronic Systems Engineering B.Sc., offered in English by the Faculty of Technology and Bionics of Rhine-Waal University of Applied Sciences, and are valid in conjunction with the General Examination Regulations ("RPO") of Rhine-Waal University of Applied Sciences. They apply to the standard, seven-semester mode of study (full-time study) as well as the nine-semester, dual-vocational mode of study (dual study).

Section 2
Academic objectives; purpose of examination; degree awarded

(1) The bachelor's examination forms the basis for this professionally-qualifying degree. The overall aims and objectives for this degree programme are outlined in Section 3 RPO. A strong command of the English language is essential to success in this degree programme, as it is a necessary prerequisite for the overarching goal of consolidating and expanding students' technical language and communication skills.

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

Section 3
Admission requirements

(1) General admission requirements are defined in Section 4 RPO.

(2) Admission to the dual study programme requires proof of a valid and relevant vocational training contract with a German company.

(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 whose content largely and predominately falls under mechatronics.

(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 proficiency equivalent to level B2 over the course of earning their university entrance qualification 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 on the German grading scale) for the subject.

(6) The admissions process and requirements for non-EU international applicants are set forth in the Entrance Examination Regulations for Mechatronic Systems Engineering B.Sc. at Rhine-Waal University of Applied Sciences from 24 March 2014 (Official Notice 15/2014).

Section 4
Basic internship

(1) The basic eight-week internship as defined by Section 4 (3) RPO should be completed at an external company, public office or other organisation that and familiarise students with questions and matters relating to materials engineering, general engineering, business organisation and business economics.

(2) The requirements for the aforementioned focus areas in the basic internship are set forth in the Internship Regulations for Engineering Programmes of the Faculty of Technology and Bionics at Rhine-Waal University of Applied Sciences.

Section 5
Programme structure; volume of instruction hours; progression of studies

(1) The total volume of instruction for this degree programme is 134 SWS (combined hours per week for all lecture periods in the standard study duration).

(2) The modules of this degree programme comprise a total sum of 210 credits according to the ECTS framework defined in Section 6 (5) RPO.

(3) On-the-job vocational training is an integrated part of the dual study programme and occurs concurrently over the course of the first four semester of study. Both the vocational training position and the company offering it must relate to the student's field of study. The faculty is responsible for judging the relevance of a proposed dual study arrangement. In the "dual" phase of study, the contents of the first two semesters for full-time students are instead taught over four semesters. During this initial period, students attend two days of lectures at the University and spend the remaining three days in the workplace. The dual phase usually concludes before the fifth semester with a comprehensive examination (in German) at the regional Chamber of Industry and Commerce or Chamber of Trades.

(4) Additional information about how this degree programme is organised and the type, form and scope of modules can be found in the recommended study and examination plan (full-time) in Annex 1 or the recommended dual study and examination plan (dual study) in Annex 2. Additional information about learning outcomes, qualification aims, contents and forms of examination can be found in the corresponding module guide, which is available for viewing in the faculty's central office.

(5) Progression in this degree programme is limited by the following thresholds:

(a) In order to register for examinations scheduled for the fourth semester or higher, students must have achieved at least 53 credits from modules scheduled for the first two semesters of study in accordance with the applicable study and examination plan. This requirement does not apply to the elective module Foreign Language.

(b) In order to register for examinations scheduled for the fifth semester or higher, students must have achieved at least 63 credits from modules scheduled for the first two semesters of study in accordance with the applicable study and examination plan. This requirement does not apply to the elective module Foreign Language.

(c) The requirements for admission to the internship semester / semester abroad are unaffected by these thresholds.

(6) For the elective module Foreign Language, non-native speakers of German should register for a German course. Native speakers of German may register for any other language course offered.

Section 6
Internship semester; semester abroad

(1) Providing support with students' search for an internship (Section 21 (4) sentence 1 RPO) as well as the option of an applied project at the University instead of an internship (Section 21 (4) sentence 2 and 3 RPO) are excluded for this degree programme in accordance with Section 21 (4) sentence 4 RPO.

(2) Deviating from Section 22 (5) and (7) RPO, the following additional requirements apply to semesters abroad. Students going abroad must plan for at least 30 credits worth of courses (or the full-time equivalent of the host university). The semester abroad can only be recognised in full if at least 30 credits (or the full-time equivalent) have been earned and this has been verified by an official certificate issued by the host university. If a student earns fewer than the planned 30 credits, but more than 15, then he or she must complete additional modules at Rhine-Waal University of Applied Sciences in order to compensate for the difference and receive full credit for the semester abroad.

(3) Students who earn fewer than 15 credits will fail the semester abroad.

(4) Students planning on going abroad must define in a learning agreement the modules and courses they wish to complete at the host university together with a qualified faculty supervisor.

(5) If students are unable to adhere to their learning agreement for reasons out of their control, then they must report this to the Examination Board without delay to arrange a new learning agreement. If students fail to report changes to their learning agreement, the Examination Board will decide whether to accept credits earned in modules or courses which were not previously agreed upon in the learning agreement.

Section 7
Scope of examinations

(1) The time allotted for a written examination depends on the number of obtainable credits. As a rule, 30 minutes are allotted for every one credit, for a total duration up to, but not exceeding, two hours.

(2) An oral examination generally lasts between 30 and 45 minutes.

(3) Assignments, term papers or projects should generally not exceed approx. 10,000 words (or approx. 30 pages, DIN A4).

Section 8
Scope and form of the thesis

(1) The main text portion of the thesis should generally be between 15,000 words (or approx. 50 pages, DIN A4) and approx. 25,000 words (or approx. 70 pages, DIN A4) in length. The thesis may also be supplemented with other media as well, provided their use is appropriate and helpful as additional documentation within the context of the assigned task. In this case the length of the text portion of the thesis may deviate from the aforementioned minimum requirement.

(2) The 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 and distinct identification by section, page numbers or other criteria.

Section 9
Admission to the thesis and colloquium

(1) In addition to the requirements for admission to the thesis defined under Section 24 (1) no. 3 RPO, students must also have obtained at least 175 credits.

(2) In addition to the requirements for admission to the colloquium defined under Section 27 (2) no. 3 RPO, students must also have obtained at least 207 credits.

Section 10
Credit values for the thesis and colloquium

(1) Twelve credits are awarded for passing the bachelor's thesis.

(2) Three credits are awarded for passing the colloquium.

Section 11
Awarding 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 referred to in Section 30 (1) RPO.

Section 12
Entry into force

(1) These examination regulations shall enter into force on the day after their publication in the Official Notices of Rhine-Waal University of Applied Sciences. They apply to students who first enrolled in Mechatronic Systems Engineering B.Sc. of the Faculty of Technology and Bionics of Rhine-Waal University of Applied Sciences in or after winter semester 2017-18.

(2) Students who first enrolled in Mechatronic Systems Engineering B.Sc. before winter semester 2017-18 may continue their studies according to the Examination Regulations dated 29 August 2013 (Official Notice 03/2013) until 28 February 2022 at the latest.

(3) Students currently studying according to the Examination Regulations dated 29 August 2013 may submit a written request to the Examination Board to switch to the Examination Regulations defined herein. The Examination Board is responsible for decisions regarding the transfer of credits for previously completed modules and examinations.

Note: These examination regulations entered into force on 7 January 2021.

Annex 1

Curriculum MSE

		HPW	Type						Examination form		CP	HPW						
			V	SL	S	Ü	Pra	Pro	Attestation	graded		WS1	SS2	WS3	SS4	WS5	SS6	WS7
1st Semester																		
2000	Introductory Mathematics	8	5			3				x	8	8						
2008	Statics and Strength of Materials	4	2			2				x	5	4						
2011	Programming	4	2				2		x	x	5	4						
2013	Business Economics & Project Management	4	3				1		x		5	4						
2305	Fundamentals of Electrical Engineering	4	2			1	1		x	x	5	4						
2900	Introduction to Engineering	3	2		1				x		3	3						
2nd Semester																		
2001	Applied Mathematcis	8	5			3				x	7		8					
2009	Advanced Strength of Materials	4	2			2				x	5		4					
2012	Advanced Programming	4	2				2		x	x	5		4					
2304	Analog Electronics	4	2			1	1		x	x	5		4					
2701	Engineering Drawing and Design	4	2			1	1		x	x	5		4					
2706	Manufacturing Technology	4	3			1				x	5		4					
3rd Semester																		
2010	Dynamics	4	2			2				x	5			4				
2108	Materials and Testing	4	2			1	1			x	5			4				
2306	Microcontroller	4	2				2		x	x	5			4				
2705	Engineering Design	4	2			2				x	5			4				
2708	Thermodynamics	4	2			1	1			x	5			4				
2901	Drives & Power Electronics	4	2			2				x	5			4				
4th Semester																		
2002	Numerical Mathematics	4	3			1				x	5				4			
2311	Embbeded Systems	4	2				2			x	5				4			
2902	System Theory and Controls	4	2			1	1			x	5				4			
2904	Modelling and Simulation	4	2				2			x	5				4			
	Focus Field (see catalogue individual subjects: Focus Fields)																	
	Focus Field Subject 1	4									5				4			
	Focus Field Subject 2	4									5				4			
5th Semester																		
2014	Cross-Cultural Management and Creativity	4	2			2			x		5					4		
2015	Group Project	1						1	x		5					1		
2903	Controls	4	2			1	1			x	5					4		
2907	Sensors and Actuator Networks	4	2			1	1			x	5					4		
	Focus Field (see catalogue individual subjects: Focus Fields)																	
	Focus Field Subject 3	4									5					4		
	Focus Field Subject 4	4									5					4		
6th Semester																		
2016	Internship / Semester abroad								x		30							
7th Semester																		
2017	Bachelor Thesis									x	12							
2018	Colloquium									x	3							
2510	Technology and Innovation Management	4	2				2			x	5							4
2512	Entrepreneurship	2						2	x		2							2
	Elective (see catalogue individual subjects: Electives)	3									5							3
		133	V	SL	S	Ü	Pra	Pro	Attestation	graded	210	27	28	24	24	21		9
Overview		HPW	Type						Examination form		CP	WS1	SS2	WS3	SS4 HPW	WS5	SS6	WS7

Catalogue Individual Subjects MSE

		HPW	Type						Examination form		CP	HPW						
			V	SL	S	Ü	Pra	Pro	Attestation	graded		WS1	SS2	WS3	SS4	WS5	SS6	WS7
Focus Fields *//***/**** **																		
	Focus Field Simulation in Mechatronics	**16**	**8**			**5**	**3**				**20**				**8**	**8**		
2710	Fluid Mechanics	4	2			1	1			x	5				4			
2908	Multibody Dynamics	4	2			2				x	5				4			
2309	Object-oriented Programming	4	2				2			x	5					4		
2905	Finite Element Method	4	2			2				x	5					4		
	Focus Field Applied Mechatronics (ME focus)	**16**	**8**			**5**	**3**				**20**				**8**	**8**		
2710	Fluid Mechanics	4	2			1	1			x	5				4			
2909	Vehicle Technology	4	2			1	1			x	5				4			
2717	Mobile Hydraulics	4	2			1	1			x	5					4		
2910	Robotics	4	2			2				x	5					4		
	Focus Field Applied Mechatronics (EL focus)	**16**	**8**			**4**	**4**				**20**				**8**	**8**		
2303	Digital Electronics	4	2			1	1		x	x	5				4			
2912	Optical Systems	4	2			1	1			x	5				4			
2308	Signal Transmission	4	2			1	1			x	5					4		
2314	Practical Electronics	4	2			**1**	**1**			x	5					4		
	Focus Field Bionics	**16**	**8**			**4**	**2**	**2**			**20**				**8**	**8**		
2723	Biomimetic Science	4	2			2				x	5				4			
2724	Zoological Physics	4	2				2			x	5				4			
2725	Bioinspiration	4	2			2				x	5					4		
2726	Bionic Design	4	2					2	x		5					4		
Electives																		
2020	Foreign Language								x		5							
2021	Module from any other Bachelor study course HSRW								x	x	5							
2911	Introduction to Scientific Methods in Mechatronics	2	1				1			x	5							2

Explanations / Conditions

* Die Fakultät behält sich das Recht vor, sowohl eine Mindestteilnehmerzahl für das Zustandekommen eines Faches im Fokusfeld / Wahlbereich als auch eine Maximalteilnehmerzahl festzulegen. Die Möglichkeit des Erreichens der vorgeschriebenen Kreditpunktanzahl aus

** Aus dem Wahlbereich können mit dem Einverständnis des Prüfungsausschusses der Fakultät Technologie und Bionik auch Fächer mit einem Gesamtumfang von 5 Kreditpunkten aus dem gesamten Bachelor Studienangebot der Hochschule Rhein Waal gewählt werden / As elective a maximum of 5 CP can be chosen with the consent of the examination committee of the faculty Technology and Bionics from any Bachelor study programme at the Rhine-Waal University of Applied Science.

*** Die Fakultät Technologie und Bionik behält sich das Recht vor, das Fächerangebot im Wahlbereich zu ändern / The faculty Technology and Bionics reserves the right to change the catalogue of electives.

**** Aufgrund von stundenplantechnischen Randbedingungen ist nicht auszuschließen, dass Fächer verschiedener Fokusfelder sowie Fächer des Wahlbereichs zeitgleich angeboten werden / Due to timetabling constraints subjects from different focus fields and electives may

Abbreviations

HPW Semesterwochenstunden / hours per week
CP Kreditpunkte / credit points
V Vorlesung / lecture
SL Seminaristische Vorlesung / seminar lecture
S Seminar / seminar
Ü Übung / exercise
Pra Praktikum / practical work
Pro Projekt / project
WSx Wintersemester / winter semester
SSx Sommersemester / summer semester

Annex 2

Curriculum MSE dual Form		HPW	Type						Examination form		CP	HPW								
			V	SL	S	Ü	Pra	Pro	Attestation	graded		WS 1	SoSe 2	WS 3	SoSe 4	WS 5	SoSe 6	WS 7	SoSe 8	WS 9
1st Semester																				
2000	Introductory Mathematics	8	5	0	0	3	0	0	0	x	8	8								
2011	Programming	4	2	0	0		2	0	x	x	5	4								
2900	Introduction to Engineering	3	2	0	1	0		0	x	0	3	3								
2nd Semester																				
2001	Applied Mathematcis	8	5	0	0	3		0	0	x	7		8							
2012	Advanced Programming	4	2	0	0	0	2	0	x	x	5		4							
2701	Engineering Drawing and Design	4	2	0	0	1	1	0	x	x	5		4							
3rd Semester																				
2008	Statics and Strength of Materials	4	2	0	0	2	0	0	0	x	5			4						
2013	Business Economics & Project Management	4	3	0	0	0	1	0	x	0	5			4						
2305	Fundamentals of Electrical Engineering	4	2	0	0	1	1	0	x	x	5			4						
4th Semester																				
2009	Advanced Strength of Materials	4	2	0	0	2	0	0	0	x	5				4					
2304	Analog Electronics	4	2	0	0	1	1	0	x	x	5				4					
2706	Manufacturing Technology	4	3	0	0	1	0	0	0	x	5				4					
5th Semester																				
2010	Dynamics	4	2	0	0	2	0	0	0	x	5					4				
2108	Materials and Testing	4	2	0	0	1	1	0	0	x	5					4				
2306	Microcontroller	4	2	0	0	0	2	0	x	x	5					4				
2705	Engineering Design	4	2	0	0	2	0	0	0	x	5					4				
2708	Thermodynamics	4	2	0	0	1	1	0	0	x	5					4				
2901	Drives & Power Electronics	4	2	0	0	2	0	0	0	x	5					4				
6th Semester																				
2002	Numerical Mathematics	4	3	0	0	1	0	0	0	x	5						4			
2311	Embbeded Systems	4	2	0	0	0	2	0	0	x	5						4			
2902	System Theory and Controls	4	2	0	0	1	1	0	0	x	5						4			
2904	Modelling and Simulation	4	2	0	0	0	2	0	0	x	5						4			
	Focus Field (see catalogue individual subjects: Focus Fields)																			
	Focus Field Subject 1	4									5						4			
	Focus Field Subject 2	4									5						4			
7th Semester																				
2014	Cross-Cultural Management and Creativity	4	2	0	0	2	0	0	x	0	5							4		
2015	Group Project	1	0	0	0	0	0	1	x	0	5							1		
2903	Controls	4	2	0	0	1	1	0	0	x	5							4		
2907	Sensors and Actuator Networks	4	2	0	0	1	1	0	0	x	5							4		
	Focus Field (see catalogue individual subjects: Focus Fields)																			
	Focus Field Subject 3	4									5							4		
	Focus Field Subject 4	4									5							4		
8th Semester																				
2016	Internship / Semester abroad	0	0	0	0	0	0	0	x	0	30									
9th Semester																				
2017	Bachelor Thesis	0	0	0	0	0	0	0	0	x	12									
2018	Colloquium	0	0	0	0	0	0	0	0	x	3									
2510	Technology and Innovation Management	4	2	0	0	0	2	0	0	x	5									4
2512	Entrepreneurship	2	0	0	0	0	0	2	x	0	2									2
	Elective (see catalogue individual subjects: Electives)	3	0	0	0	0	0	0	0	0	5									3

Overview	133	V	SL	S	Ü	Pra	Pro	Attestation	graded	210	15	0	12	12	24	24	21		9
	HPW	Type						Examination form		CP	WS 1	SoSe 2	WS 3	SoSe 4	WS 5	SoSe 6	WS 7	SoSe 8	WS 9
															HPW				

Catalogue Individual Subjects		HPW	Type						Examination form		CP	HPW								
			V	SL	S	Ü	Pra	Pro	Attestation	graded		WS 1	SoSe 2	WS 3	SoSe 4	WS 5	SoSe 6	WS 7	SoSe 8	WS 9
Focus Fields *//***/**** **																				
	Focus Field Simulation in Mechatronics	**16**	**8**	**0**	**0**	**5**	**3**	**0**	**0**	**0**	**20**									
2710	Fluid Mechanics	4	2	0	0	1	1	0	0	x	5						4			
2908	Multibody Dynamics	4	2	0	0	2	0	0	0	x	5						4			
2309	Object-oriented Programming	4	2	0	0	0	2	0	0	x	5							4		
2905	Finite Element Method	4	2	0	0	2	0	0	0	x	5							4		
	Focus Field Applied Mechatronics (ME focus)	**16**	**8**	**0**	**0**	**5**	**3**	**0**	**0**	**0**	**20**						**8**	**8**		
2710	Fluid Mechanics	4	2	0	0	1	1	0	0	x	5						4			
2909	Vehicle Technology	4	2	0	0	1	1	0	0	x	5						4			
2717	Mobile Hydraulics	4	2	0	0	1	1	0	0	x	5							4		
2910	Robotics	4	2	0	0	2	0	0	0	x	5							4		
	Focus Field Applied Mechatronics (EL focus)	**16**	**8**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**20**						**8**	**8**		
2303	Digital Electronics	4	2	0	0	1	1	0	x	x	5						4			
2912	Optical Systems	4	2	0	0	1	1	0	0	x	5						4			
2308	Signal Transmission	4	2	0	0	1	1	0	0	x	5							4		
2314	Practical Electronics	4	2	0	0	1	1	0	0	x	5							4		
	Focus Field Bionics	**16**	**8**	**0**	**0**	**4**	**2**	**2**	**0**	**0**	**20**						**8**	**8**		
2723	Biomimetic Science	4	2	0	0	2	0	0	0	x	5						4			
2724	Zoological Physics	4	2	0	0	0	2	0	0	x	5						4			
2725	Bioinspiration	4	2	0	0	2	0	0	0	x	5							4		
2726	Bionic Design	4	2	0	0	0	0	2	x	0	5							4		
Electives																				
2020	Foreign Language	0	0	0	0	0	0	0	x	0	5									
2021	Module from any other Bachelor study course HSRW	0	0	0	0	0	0	0	x	x	5									
2911	Introduction to Scientific Methods in Mechatronics	2	1	0	0	0	1	0	0	x	5									2

Explanations / Conditions

* Die Fakultät behält sich das Recht vor, sowohl eine Mindestteilnehmerzahl für das Zustandekommen eines Faches im Fokusfeld / Wahlbereich als auch eine Maximalteilnehmerzahl festzulegen. Die Möglichkeit des Erreichens der vorgeschriebenen Kreditpunktanzahl aus dem Vertiefungsfeld bleibt unberührt./ * The faculty reserves the right to determine a minimum and a maximum number of participants for offering a subject in the focus fields / electives. The possibility to obtain the required number of credit points remains unaffected.

** Aus dem Wahlbereich können mit dem Einverständnis des Prüfungsausschusses der Fakultät Technologie und Bionik auch Fächer mit einem Gesamtumfang von 5 Kreditpunkten aus dem gesamten Bachelor-Studienangebot der Hochschule Rhein Waal gewählt werden / As elective a maximum of 5 CP can be chosen with the consent of the examination committee of the faculty Technology and Bionics from any Bachelor study programme at the Rhine-Waal University of Applied Science.

*** Die Fakultät Technologie und Bionik behält sich das Recht vor, das Fächerangebot im Wahlbereich zu ändern / The faculty Technology and Bionics reserves the right to change the catalogue of electives.

**** Aufgrund von stundenplantechnischen Randbedingungen ist nicht auszuschließen, dass Fächer verschiedener Fokusfelder sowie Fächer des Wahlbereichs zeitgleich angeboten werden / Due to time tabling constraints subjects from different focus fields and electives may be offered concurrently.

Abbreviations

HPW Semesterwochenstunden / hours per week
CP Kreditpunkte / credit points
V Vorlesung / lecture
SL Seminaristische Vorlesung / seminar lecture
S Seminar / seminar
Ü Übung / exercise
Pra Praktikum / practical work
Pro Projekt / project
WSx Wintersemester / winter semester
SSx Sommersemester / summer semester