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# Examination Regulations

for

## Electrical and Electronics Engineering B.Sc.

Rhine-Waal University of Applied Sciences

Dated 9 January 2018

(Official Notice 21/2018)

As amended by the

Second amending statutes

Dated 16 November 2022

(Official Notice 11/2023)

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## **Section 1 Scope**

These examination regulations apply to Electrical and Electronics Engineering B.Sc., offered in English at 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 govern the full-time, seven-semester mode of study.

## **Section 2 Academic objectives; purpose of examination; degree awarded**

(1) This degree programme concludes with the bachelor’s examination, which forms the basis for the professionally qualifying nature of the 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 for successfully completing the bachelor’s examination.

## **Section 3 Admission requirements**

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

(2) Intentionally omitted.

(3) A “related or comparable programme of study” within the meaning of Section 4 (6) RPO is defined as any bachelor’s or *Diplom* degree programme at a university or university of applied sciences whose content can be predominately attributed to the field of engineering, with a focus on 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 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 for English of at least “sufficient” (4.0 or better on the German grading scale).

(6) The admissions process and requirements for non-EU international applicants are set forth in the Entrance Examination Regulations for Electrical and Electronics Engineering B.Sc. at Rhine-Waal University of Applied Sciences from 24 March 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 semester hours (SWS).

(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) Intentionally omitted.

(4) Additional information about the breakdown of this degree programme and the type, form and scope of modules is available in the study and examination plan at the end of this document. Additional information about learning outcomes, qualification aims, contents and forms of examination is available 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) The option of assisting students in their 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) sentences 2 and 3 RPO) are hereby excluded from 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 planning a semester abroad must obtain a minimum of 30 credits (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 obtained and this is verified by an official certificate from the host university. Students who have earned fewer than the planned 30 credits, but at least 15 credits, must complete additional modules at Rhine-Waal University of Applied Sciences to make up for the difference and receive full credit (30 credits) for the semester abroad.

(3) The semester abroad is considered failed if fewer than 15 credits were obtained.

(4) Students planning a semester abroad must conclude a learning agreement with the faculty advisor designated in the module guide, in which the modules they intend to complete at the host university are clearly defined.

(5) Students who are unable to adhere to their learning agreement for reasons out of their control must report their circumstances 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 as additional documentation is appropriate and helpful 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 set forth in Section 23 (1) RPO and is clearly distinguishable (and thus assessable) thanks to clear and distinct delimitation by sections, 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 undergraduate 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 upon issuing of the bachelor's degree certificate defined 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 Electrical and Electronics 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 enrolled in the degree programme Electronics B.Sc. before winter semester 2017-18 may continue their studies according to the Examination Regulations dated 29 August 2013 (Official Notices 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 all credit recognition decisions for modules and examinations completed under previous examination regulations.

Note: This amended version of the examination regulations entered into force on 16 March 2023.

Annex 1 from 18 December 2019:

Curriculum EL		HPW	Type						Examination form		CP	HPW						
			V	SL	S	Ü	Pra	Pro	Attestation	graded		WS1	SS2	WS3	SS4	WS5	SS6	WS7
<b>1<sup>st</sup> Semester</b>																		
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	5	4						
2013	Business Economics & Project Management	4	3				1			x	5	4						
2300	Introduction to Electrical Engineering	3	2		1					x	3	3						
2301	Electrical Engineering I	4	2			1	1			x	5	4						
<b>2<sup>nd</sup> Semester</b>																		
2011	Applied Mathematics	8	5			3				x	7	8						
2003	Physics	4	2			1	1			x	5	4						
2012	Advanced Programming	4	2				2			x	5	4						
2302	Electrical Engineering II	4	2			1	1			x	5	4						
2303	Digital Electronics	4	2			1	1			x	5	4						
2304	Analog Electronics	4	2			1	1			x	5	4						
<b>3<sup>rd</sup> Semester</b>																		
2014	Cross-Cultural Management and Creativity	4	2			2				x	5			4				
2306	Microcontrollers	4	2				2			x	5			4				
2307	Fields and Waves	4	2			2				x	5			4				
2308	Signal Transmission	4	2			1	1			x	5			4				
2309	Object oriented Programming	4	2				2			x	5			4				
2901	Drives and Power Electronics	4	2							x	5			4				
<b>4<sup>th</sup> Semester</b>																		
2323	Materials and Manufacturing of Electronics	4	3			1				x	5			4				
2311	Embedded Systems	4	2				2			x	5			4				
2310	Signal Processing & Measurement Technology	4	1			1	2			x	5			4				
2902	System Theory and Controls	4	2			1	1			x	5			4				
Focus Field (see catalogue individual subjects: Focus Fields)																		
Focus Field Subject 1																		
Focus Field Subject 2																		
<b>5<sup>th</sup> Semester</b>																		
2015	Group Project	1						1		x	5				1			
2312	Microelectronic Control Systems	4	2			1	1			x	5			4				
2325	Communication Networks	4	2			2				x	5			4				
2314	Practical Electronics	4	2			1	1			x	5			4				
Focus Field (see catalogue individual subjects: Focus Fields)																		
Focus Field Subject 3																		
Focus Field Subject 4																		
<b>6<sup>th</sup> Semester</b>																		
2016	Internship / Semester abroad									x	30							
<b>7<sup>th</sup> Semester</b>																		
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																		
<b>Overview</b>		133	V	SL	S	Ü	Pra	Pro	Attestation	graded	210	27	28	24	24	21	9	
		HPW	Type						Examination form		CP	WS1	SS2	WS3	SS4	WS5	SS6	WS7

Catalogue Individual Subjects EL		HPW	Type						Examination form		CP	HPW						
			V	SL	S	Ü	Pra	Pro	Attestation	graded		WS1	SS2	WS3	SS4	WS5	SS6	WS7
<b>Focus Fields **/**/**/**/**/**</b>																		
<b>Focus Field Electronics</b>		12	8			4	0				20			6	6			
2315	Low Power Design	3	2			1				x	5			3				
2316	Design of env. friendly Circuits and Recycling of Electr.	3	2			1				x	5			3				
2317	Opoelectronics	3	2			1				x	5			3				
2318	Nanoelectronics	3	2			1				x	5			3				
<b>Focus Field Communication</b>		13	7			3	3				20			6	7			
2319	Mobile Information Devices	3	2			1				x	5			3				
2320	Audio & Speech Processing	3	2				1			x	5			3				
2321	Biomedical Electronics	4	2			2				x	5			4				
2322	Networks in Industrial Automation	3	1			1	1			x	5			3				
<b>Focus Field Controls</b>		15	8			4	3				20			7	8			
2002	Numerical Mathematics	4	2			2				x	5			4	8			
2324	Brain Computer Interfaces	3	2				1			x	5			3				
2903	Controls	4	2			1	1			x	5			4				
2907	Sensors & Actuator Networks	4	2			1	1			x	5			4				
<b>Alternative Modules*</b>		8									10							
2020	Foreign Language / free elective	4									5			4				
2020	Foreign Language / free elective	4									5			4				
<b>Electives</b>																		
2019	Scientific Methods (Block or online)	4	2			2				x	5					4		
2020	Foreign Language									x	5							
2021	Module from any other Bachelor study course HSRW									x	5							

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 Kreditpunktzahl 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.
- + Bei Wahl eines dieser Alternativmodule kann kein komplettes Fokusfeld mehr belegt werden / Selecting one of these modules leads to losing the focus field named on your degree.

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
- WS Wintersemester / winter semester
- SS Sommersemester / summer semester