§ 36 Bachelor's Study Program Electrical Engineering and Information Technology

1. Structure of the Study Program

The Bachelor's study program in Electrical Engineering and Information Technology is divided into the first two semesters of basic studies and the main study program, which concludes with the Bachelor's examination in the seventh semester.

It is also possible to complete the study program while integrating apprenticeship. Detailed regulations are described in section 7.

A practical semester and courses amounting to 180 ECTS credits are required to successfully complete the study program. The total of 210 ECTS is made up of 6 semesters of theory with 30 ECTS each and a practical semester with 30 ECTS.

Two specializations (profiles) are offered in the main course of study:

- Automation Technology and
- Communication Technology.

When re-registering for the 4th semester, students must decide on one of the fields of study by submitting a written application.

German-speaking students who begin their studies in the summer semester must take English in the language module.

2. Courses

The general part of the Study and Examination Regulations (in particular §3 paragraph 3: Courses may also be offered in English in individual cases by resolution of the respective Faculty Board) is not overridden by this special part.

The courses of the first four semesters are offered in English for students starting in the summer semester (on an annual basis). Laboratories can be planned bilingually. All other semesters are offered in German (§3 paragraph 3 applies). Compulsory elective courses may also be offered in English without the approval of the Faculty Board. All courses include an exercise component.

The courses required for successful completion as well as the associated study and examination achievements are listed in Tables 1 to 5 below.

The following abbreviations are used:

Type of course		Type of exam		Scope of exam	
V	Lecture	**B**	Bachelor's Thesis	**SWS**	Semester hours
PR	Project	**R**	Seminar Paper and presentation	**ECTS**	ECTS points in compliance with the European Credit Transfer System
S	Seminar	**PF**	Portfolio	**E**	Medium of instruction is English
P	Practical, exercises	**K(xx)**	Written examination duration of xx minutes	**D**	Medium of instruction is German
		M	Oral examination		
		PA	Practical work (lab, term or seminar paper or project work)		
		RPA	Practical work documented by a seminar paper and presentation (PF: 50% PA graded and 50% R graded)		

3. Elective Modules

Students choose 2 compulsory elective modules from Table 3 (if they have chosen a specialization in Communication Technology) or Table 4 (if they have chosen a specialization in Automation Technology). They also choose one elective module. The elective modules are announced at the beginning of each semester. The modules from Tables 3 and 4 that are not used as compulsory elective modules can also be taken as elective modules. If elective modules from other universities are chosen, special approval from the Examination Board is required. Tutoring activities can be recognized as electives up to a maximum of 5 ECTS. Elective modules from the field of electrical engineering and computer science can be chosen across all specializations.

4. Accredited Examinations

The examinations are listed in Tables 1 to 4. Each examination must be passed. Otherwise, § 8 of these study and examination regulations applies. The assessment of the examinations is carried out in accordance with § 13 of these study and examination regulations.

5. Practical Semester (Compulsory)

The 5th semester is a practical semester. The practical semester can only be taken up if the student has successfully completed all examinations of the first two semesters. In the apprenticeship-integrated study variant, the compulsory practical semester can also be completed in practical phases during the lecture-free period in the theory semesters in the cooperating company (see section 7).

In the practical semester, students should work on an engineering task from the fields of automation technology, energy technology, communication technology and sales and get to know the technical requirements, industrial working methods and the operational environment in the planning, development and use of electronic networks and systems.

Fields of work can be:

- Planning and realization of electronic and information technology systems
- Planning, design and development of electronic circuits
- Testing of networks and systems
- Software development
- Use of computers for circuit and system design (CAD)
- Computer simulation
- Planning, design and development of electrical drives
- Planning and realization of mechatronic systems in vehicle technology
- Technical sales support

Total duration: at least 22 weeks with at least 95 attendance days in the practical company.

6. Bachelor's Thesis

The Bachelor's thesis can only be started once all coursework from the first four semesters of study and the practical semester have been completed. The topic, task and scope of the Bachelor's thesis must be limited by the person setting the task in such a way that the thesis can be completed in approx. 360 working hours, corresponding to 12 ECTS. Section 12 of the General Part of the Study and Examination Regulations applies.

7. Apprenticeship-integrated Study Program

The curriculum for the apprenticeship-integrated study option includes 9 semesters and leads to a degree in a recognized apprenticeship vocation (e.g. electronics technician for energy and building technology, electronics technician for industrial engineering, mechatronics technician). The semesters of the non-apprenticeship-integrated study variant are integrated into the extended curriculum (see Table 5). The curriculum is supplemented by apprenticeship content in a cooperating company and a commercial school; this apprenticeship content is the responsibility of the cooperating company or the commercial school and contributes to the degree in the apprenticeship and not to the Bachelor's degree. The compulsory practical semester is completed in practical phases during the lecture-free period in the theory semesters in the cooperating company (see paragraph 5). The project with seminar and the Bachelor's thesis can be completed in the cooperating company.

8. Validity

These study and examination regulations will come into force in the winter semester 2024/25.

Table 1: Bachelor's Study Program Electrical Engineering and Information Technology
Basic: for students of the english study program

Module	Course	Curricular semester assigned				Graded examination
			1	2	3	
		Type	ECTS/ SWS	ECTS/ SWS	ECTS/ SWS	
Electrical Engineering 1: Basics	Analysis of Electric Networks	V	5/4			K90
Electrical Engineering 2: Electrodynamics	Electrodynamics	V		5/4		K90
Electrical Engineering 3: Time and Frequency Domains	Circuit Analysis in the Time and Frequency Domains	V			5/4	K90
Metrology 1: Basics	Metrology 1	V		5/4		K90 *
	Metrology Lab	P *				
Metrology 2: Advanced	Metrology 2	V			5/4	K90 *
	Electronics Practical: Linear Meterology	P *				
Mathematics 1: Analysis 1	Analysis 1 with Exercises	V	5/4			K90
Mathematics 2: Linear Algebra	Linear Algebra with Exercises	V	5/4			K90
Mathematics 3: Analysis 2	Analysis 2 with Exercises	V		5/4		K90
Electronics 1: Basics	Basic Practical Electrical Engineering 1	P *	5/4			PF *
	Electronics 1	V				
Programming	Programming	V+P	5/4			K90
Electronics 2: Advanced	Basic Practical Electrical Engineering 2	P		5/4		PF
	Electronics 2	V				
Object-Oriented Programming	Object-Oriented Programming	V+P		5/4		K90
Digital Technology	Digital Technology	V+P *		5/4		K90 *
Mathematics 4: Statistics and Numeric	Statistics	V+P			5/4	PF
	Numeric	V+P				
Computer Technology	Computer Technology	V+P *			5/4	K90 *
Sustainable Electronics	Design of Efficient Circuits	V			5/4	K90
Electronics 3: Circuit Design	Circuit Design	V+P			5/4	PF
	Basic Practical Electrical Engineering 3	P				
Physics Mechanics	Physics Mechanics	V	5/4			K90
Sum ECTS / SWS			**30/24**	**30/24**	**30/24**	

** Successful completion of the practical course is a prerequisite for participation in the module examination*

Table 2: Bachelor's Study Program Electrical Engineering and Information Technology
Main: for students of the english study program

Module	Course	Curricular semester assigned					Graded examination
			4	5	6	7	
		Type	ECTS/ SWS	ECTS/ SWS	ECTS/ SWS	ECTS/ SWS	
Digital Signal Processing	Digital Signal Processing	V+P		Practical Study Semester	5/4		PF
Circuit Design	Computer aides Circuit Design	V+P	5/4				PF
Language	German	V+P	5/4				PF
Communication Technology	Communication Technology	V	5/4				K90
Robotics	Robotics	V+P			5/4		PF
Seminar: Scientific Work	Scientific Work	S+P			5/4		RPA
Communication Networks	Communication Networks	V				5/4	K90
Control Systems	Control Systems	V			7/6		K90 *
	Control Systems Practical	P *					
Microcontroller	Microcontroller	V	5/4				RPA
	Microcontroller Practical	P					
Automation Technology	Automation Technology 1	V			3/2		K90 *
	Automation Technology 2	V+P *				5/4	
Profile	Compulsory Elective 1	-			5/4		see subject
Profile	Compulsory Elective 2	-				5/4	see subject
Elective	Elective Subject	-	5/4				see subject
Project work	Practical project	PR	5/0				RPA
Bachelor's thesis	Bachelor's thesis incl. final colloquium (20% of the grade)					15/0	B+R
Sum ECTS / SWS			**30/24**	**30/0**	**30/24**	**30/12**	

** Successful completion of the practical course is a prerequisite for participation in the module examination*

Table 3: Bachelor's Study Program Electrical Engineering and Information Technology
Main: Study Focus Communication for students of the English study program (2 out of x)

Module	Course	SoSe or WiSe			Graded examination
			ECTS/ SWS	ECTS/ SWS	
		Type	SoSe	WiSe	
Internet Applications	Internet Applications	V+P	5/4		PF
Automotive Electronics Controls	Automotive Electronics Controls	V		5/4	K90
Image Processing	Basics of Image Processing	V+P	5/4	5/4	PF
Traffic Telematics	Traffic Telematics	V	5/4	5/4	M
Seminar: Communication	Accompanying Seminar Practical Project: Communication	P	5/4	5/4	M
Selected topics	Special Offers according to Notice Board	V+P	Notice Board	Notice Board	Notice Board

Table 4: Bachelor's Study Program Electrical Engineering and Information Technology
Main: Study Focus Automation for students of the English study program (2 out of x)

Module	Course	SoSe or WiSe			Graded examination
			ECTS/ SWS	ECTS/ SWS	
		Type	SoSe	WiSe	
Introduction to Power Train Engineering	Introduction to Power Train Engineering	V	5/4		K90
Real-time programming	Real-time programming	V	5/4	5/4	K90 *
	Real-time programming Practical	P*			
Power Electronics	Power Electronics	V	5/4	5/4	K90
High-voltage Vehicles	High-voltage Vehicles	V+P	5/4	5/4	PF
Image Processing	Image Processing Basics	V+P	5/4	5/4	PF
Seminar: Automation	Accompanying Seminar Practical Project: Automation	P	5/4	5/4	M
Selected topics	Special Offers according to Notice Board	V+P	Notice Board	Notice Board	Notice Board

Table 5: Bachelor Program Electrical Engineering and Information Technology
Curriculum for the training-integrated study variant (German only)

Semester	Unternehmen	Hochschule	Abschluss
1	Vertrag/Vorstellung		
2	Ausbildung		
3		1. Theoriesemester	Grundstudium
4		2. Theoriesemester	Grundstudium
5		3. Theoriesemester	Hauptstudium
6		4. Theoriesemester	Hauptstudium
7	Praxis		
8		6. Theoriesemester	Hauptstudium
9	Bachelorarbeit	7. Theoriesemester	B. Eng.