§ 48 Bachelor's Study Program E-Mobility and Green Energy

1. Structure of Study Program

The Bachelor's study program E-Mobility and Green Energy 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 in an integrating apprenticeship. Detailed regulations are described in section 7.

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

German-speaking students who start their study program in the summer semester have to take the module Language, English.

2. Courses

The General Part of the Study and Examination Regulations (in particular § 3 section 3: Courses may also be offered in English in individual cases by decision 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 section 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 programs and examinations are listed in Tables 1 to 4 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. Profile-building Modules and Elective Modules

Students choose three profile-forming modules from Table 3. They also choose two elective modules. The elective modules are announced at the beginning of each semester. The modules from Table 3 that are not used as profile-forming 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.

4. Accredited Examinations

The examinations are listed in Tables 1 to 4. Each examination must be passed. Otherwise, § 8 of the General Part of the Study and Examination Regulations applies. The assessment of the examinations is carried out in accordance with § 13 of the General Part of the Study and Examination Regulations.

5. Practical Study Semester (compulsory)

The fifth semester is a practical study semester. The practical study 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 study semester, students should work on an engineering task from the fields of electrical engineering or automotive engineering and become familiar with 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 study 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 approximately 360 working hours, corresponding to 12 ECTS. § 12 of the General Part of the Study and Examination Regulations applies.

7. Apprenticeship-integrated Study Program

The curriculum for the apprenticeship-integrated study variant comprises 9 semesters and leads to a qualification in a recognized apprenticeship occupation (e.g. automotive mechatronics technician) by the end of the study period at the latest. The semesters of the non-apprenticeship-integrated study variant are integrated into the extended curriculum (see Table 3). The curriculum is supplemented by training content in a cooperating company and a commercial school; this training content is the responsibility of the cooperating company or the commercial school and contributes to the degree in the training occupation and not to the Bachelor's study program. The compulsory practical study semester is completed in practical phases during the lecture-free period in the theory semesters in the cooperating company (see section 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 E-Mobility and Green Energy

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 *				
Machine design	Machine design	V			5/4	K90
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				
Automotive engineering	Automotive engineering	V		5/4		PF
Digital Technology	Digital Technology	V + P *		5/4		K90 *
Automotive engineering: practice and digital design (CAD)	Practical automotive engineering	P *			5/4	PF*
	CAD	P				
Materials science	Materials science	V	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 E-Mobility and Green Energy

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
Power Electronics	Power Electronics	V	5/4				K90
Language	German	V+P	5/4				PF
Real-time Programming	Real-time Programming	V	5/4				K90*
	Real-time Programming Practical	P *					
Seminar: Scientific Work	Scientific Work	S+P			5/4		RPA
Introduction to Drive Engineering	Introduction to Drive Engineering	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					
Renewable Energies and Energy Storage	Renewable Energies and Energy Storage	V				5/6	PF
	Practical Environment and Process Engineering	P					
Profile 1	Compulsory elective 1	see subject			5/4		see subject
Profile 2	Compulsory elective 2	see subject				5/4	see subject
Profile 3	Compulsory elective 3	see subject				5/4	see subject
Elective Module 1	Elective Subject 1	see subject	5/4				see subject
Elective Module 2	Elective Subject 2	see subject			3/2		see subject
Practical Project	Project Work	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**	**30/14**	

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

Table 3: Bachelor's Study Program E-Mobility and Green Energy
Modules: Profiles, Study)

Module	Course	SoSe or WiSe			Graded examination
			ECTS/ SWS	ECTS/ SWS	
		Type	SoSe	WiSe	
High Voltage Vehicles	High Voltage Vehicles	V+P	5/4	5/4	PF
Electric Power Trains	Hybrids in cars	V	5/4	5/4	K90
Automotive Electronics Controls	Automotive Electronics Controls	V		5/4	K90
Traffic Telematics	Traffic Telematics	V	5/4	5/4	M
Solar Cells, Fuel Cells and Batteries	Photovoltaics	V	5/4	5/4	K90
	Fuel Cells and Batteries	V			
Mathematics 4	Statistics	V+P	3/2	3/2	K60
Heat Transfer	Basics Heat Transfer	V+P	5/4	5/4	K90
Robotics	Robotics	V+P	5/4	5/4	PF
Image Processing	Basics Image Processing	V+P	5/4	5/4	PF
Selected topics	Special Offers according to Notice Board				

Table 4: Bachelor's Study Program E-Mobility and Green Energy
Curriculum for the apprenticeship-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.