HOCHSCHULE HEILBRONN

Bachelor's degree programme: Mechanical Engineering (MB-B)

The following study and examination regulations (in German "SPO") were verified and approved by the Senate at its 454th meeting on 30 April 2025.

Only the German version of this document is legally binding!

Prof. Dr. Ulrich Brecht
Prorector for Learning and Teaching

§ 48

Bachelor's degree programme in Mechanical Engineering (MB-B)

1 Basics of the programme structure

1.1 Total scope

The total scope of the compulsory and compulsory elective courses required for successful completion of the programme is **131** semester hours per week and leads to the acquisition of **210** ECTS credits.

1.2 Structure of the programme

The compulsory courses required for successful completion of the programme and the associated examinations and preliminary examination requirements are listed in Tables 2.1 and 2.3 and Table 3. The courses are assigned to individual modules, which are awarded ECTS credits.

1.3 Language

All courses are held in either German or English (§3 (5), SPO AT Bachelor 7sem).

1.4 Basic studies in German or English

Depending on admission, the basic studies must be completed in either German or English.

2 Basic studies

2.1 Basic studies in German

2.1.1 Subjects taught in German

The courses in the basic study programme are listed in Table 2.1.

Table 2.1: Basic studies in German[1]

Semester	Course					Examination		Prerequisite		ECTS
	Module	No	Course title	Type	SWS	Type	Duration	Type	Duration	
1	G1	**612010**	**Mathematics 1**			LK	90			
		612011	Mathematics 1	V/Ü	6	Module exam				5
	G3	**612030**	**Physics**			LK	90			
		612031	Physics	V/Ü	4	Module exam				5
	G5	**612050**	**Computer Science 1**			LK	90			
		612051	Computer Science 1	V/Ü	4	Module exam				5
	G7	**612070**	**Electrical Engineering and Electronics 1**			LK	90			
		612071	Electrical Engineering and Electronics 1	V/Ü	4	Module exam				5
	G9	**612090**	**Technical Mechanics 1**			LK	60			
		612091	Technical Mechanics 1	V/Ü	4	Module exam				5
	G11	**612110**	**Construction 1**							
		612111	Fundamentals of design	V/Ü				SK	90	2.5
		612112	Design 1	V/Ü	2			SA		2.5
Total 1st semester					**26**	**5**		**2**		**30**

2	G2	**612020**	**Mathematics 2**			LK	120			
		612021	Mathematics 2	V/Ü	4	Module exam				5
	G4	**612040**	**Materials**			PK	90			
		612041	Materials: Metals	V/Ü	2	Module exam				2.5
		612042	Materials: Plastics	V/Ü	2	Module test				2.5
	G6	**612060**	**Computer Science 2**			LK	120			
		612061	Computer Science 2	V/Ü	4	Module exam				5
	G8	**612080**	**Electrical Engineering and Electronics 2**							
		612081	Electrical Engineering and Electronics 2	V/Ü	2	LK	9			2.5
		612082	Electrical Engineering Laboratory	L/S	2			SL		2.5
	G10	**612100**	**Technical Mechanics 2 and 3**			PK	120			
		612101	Technical Mechanics 2	V/Ü	2	Module exam				2.5
		612102	Technical Mechanics 3	V/Ü	2	Module exam				2.5
	G12	**612120**	**Design 2 and strength**			LK	120			
		612121	Design 2 with strength of materials	V/Ü	6	Module exam				5
Total 2nd semester					**26**	**6**		**1**		**30**

[1] See https://cdn.hs-heilbronn.de/ff7396326d75e064/21b0725bd705/2014-05-04-SPO-AT-Bachelor_ENGLISCH.pdf page 26 for abbreviations

2.1.2 Module exams of the German basic studies

The Module exams of the basic studies are listed in Table 2.2:

Table 2.2: Module exams of the Bachelor's preliminary examination, Weighting of individual examination results and module grades

Module grades for the basic study programme: Mechanical engineering (MB)					
Module	**No**	**Module description**			**Weighting of the module grade for the grade in accordance with § 22**
		Examination performance	**No.**	**Prerequisite**	
Mathematical and scientific fundamentals					
G1	**612010**	**Mathematics 1**			**5**
	612011	Mathematics 1			
G2	**612020**	**Mathematics 2**			**5**
	612021	Mathematics 2			
G3	**612030**	**Physics**			**5**
	612031	Physics			
G4	**612040**	**Materials**[1)]			**5**
	612041	Materials: Metals			
	612042	Materials: Plastics			
Computer science					
G5	**612050**	**Computer science 1**			**5**
	612051	Computer Science 1			
G6	**612060**	**Computer Science 2**			**5**
	612061	Computer Science 2			
Electrical Engineering					
G7	**612070**	**Electrical Engineering and Electronics 1**			**5**
	612071	Electrical Engineering and Electronics 1			
G8	**612080**	**Electrical Engineering and Electronics 2**			**5**
	612081	Electrical Engineering and Electronics 2			
			612082	Electrical Engineering Laboratory	
Technical mechanics					
G9	**612090**	**Technical Mechanics 1**			**5**
	612091	Technical Mechanics 1			
G10	**612100**	**Technical Mechanics 2 and 3**			**5**
	612101	Technical Mechanics 2			
	612102	Technical Mechanics 3			
Construction					
G11	**612110**	**Design 1**			**0**
	612111	Fundamentals of design			
	612112	Design theory 1			
G12	**612120**	**Design 2 and Strength**			**5**
	612121	Design 2 with strength of materials			
Total					**55**

2.1.3 Admission requirements

To participate in 612082 Electrical Engineering Laboratory, 612070 Electrical Engineering and Electronics 1 must have been passed.

2.2 Basic studies in English

2.2.1 Subjects in English

The courses in the basic studies in English are listed in Table 2.3.

Table 2.3: Basic studies in English

Semester	Course					Examination		Prerequisite		ECTS
	Module	No	Course title	Type	SWS	Type	Duration	Type	Duration	
1	G1	**612510**	**Mathematics 1**			LK	90			
		612511	Mathematics 1	V/Ü	6	Module exam				5
	G3	**612530**	**Physics**			LKBK	90			
		612531	Physics	V/Ü	4	Module exam				5
	G4	**612540**	**Electrical Engineering and Electronics 1**			LK	90			
		612541	Electrical Engineering and Electronics 1	V/Ü	4	Module exam				5
	G6	**612560**	**Programming 1**			LK	90			
		612561	Programming 1	V/L	4	Module exam				5
	G8	**612580**	**Engineering Mechanics 1**			LK	60			
		612581	Engineering Mechanics 1	V/Ü	4	Module exam				5
	G11	**612610**	**German Language and Academic Skills 1** [1)]			LP				
		612611	German Language and Academic Skills 1	V/S	4	Module exam				5
Total 1st semester					**26**	**6**		**0**		**30**
2	G2	**612520**	**Mathematics 2**			LK	120			
		612521	Mathematics 2	V/Ü	4	Module exam				5
	G5	**612550**	**Electrical Engineering and Electronics 2**							
		612551	Electrical Engineering and Electronics 2	V/Ü	2	LK	90			2.5
		612552	Electrical Engineering Laboratory	L/S	2			SL		2.5
	G7	**612570**	**Programming 2**			LK	120			
		612571	Programming 2	V/L	4	Module exam				5
	G9	**612590**	**Engineering Mechanics 2 and 3**			PK	120			
		612591	Engineering Mechanics 2	V/Ü	2	Module exam				2.5
		612592	Engineering Mechanics 3	V/Ü	2	Module exam				2.5
	G10	**612600**	**Materials**			PK	90			
		612601	Materials: Plastics	V/Ü	2	Module exam				2.5
		612602	Materials: Metals	V/Ü	2	Module exam				2.5
	G12	**612620**	**German Language and Academic Skills 2** [2)]			LP				
		612621	German Language and Academic Skills 2	V/S	4	Module exam				5
Total 2nd semester					**24**	**6**		**1**		**30**

[1)] *612610 German Language and Academic Skills 1*: Written and oral knowledge of German at level B1, proven by a written examination (with an oral component if applicable), e.g. telc B1, Goethe Zertifikat B1, DSD I or equivalent

[2] *612620 German Language and Academic Skills 2*: Written and oral knowledge of German at level B2, proven by a written examination (with an oral component if applicable), e.g. telc B2, Goethe Zertifikat B2, DSD II, TestDaF 3, DSH 1 or equivalent; see also point 3.5

2.2.2 Module exams of the basic English course

The Module exams of the basic studies are listed in Table 2.4:

Table 2.4: Module exams of the Bachelor's preliminary examination, Weighting of the grades for the individual examination components and module grades

Module grades for the basic studies in English: Mechanical Engineering (MB)					
Module	**No**	**Module name**			**Weighting of the module grade for the grade in accordance with § 22**
		Examination	**No**	**Preliminary examination**	
Mathematics and Physics					
G1	**612510**	**Mathematics 1**			**5**
	612511	Mathematics 1			
G2	**612520**	**Mathematics 2**			**5**
	612521	Mathematics 2			
G3	**612530**	**Physics**			**5**
	612531	Physics			
Electrical Engineering					
G4	**612540**	**Electrical Engineering and Electronics 1**			**5**
	612541	Electrical Engineering and Electronics 1			
G5	**612550**	**Electrical Engineering and Electronics 2**			**5**
	612551	Electrical Engineering and Electronics 2			
			612552	Electrical Engineering Laboratory	
Programming					
G6	**612560**	**Programming 1**			**5**
	612561	Programming 1			
G7	**612570**	**Programming 2**			**5**
	612571	Programming 2			
Engineering Mechanics					
G8	**612580**	**Engineering Mechanics 1**			**5**
	612581	Engineering Mechanics 1			
G9	**612590**	**Engineering Mechanics 2 and 3**			**5**
	612591	Engineering Mechanics 2			
	612592	Engineering Mechanics 3			
G10	**612600**	**Materials**			**5**
	612601	Materials: Plastics			
	612602	Materials: Metals			
German and Academic Skills					
G11	**612610**	**German Language and Academic Skills 1**			**5**
	612611	German Language and Academic Skills 1			
G12	**612620**	**German Language and Academic Skills 2**			**5**
	612621	German Language and Academic Skills 2			
Total					**60**

2.2.3 Admission requirements

To participate in 612552 Lab Electrical Engineering, 612540 Electrical Engineering and Electronics 1 must have been passed.

2.3 Bachelor's preliminary examination

The preliminary examination for the German and English basic studies comprises the module grades for all modules listed in Table 2.2 (German) or Table 2.4 (English). If several performance assessments take place at course level within a module, the module grade is determined according to a weighted arithmetic mean of the individual performances contained in the module in accordance with the ECTS. The overall grade for the preliminary Bachelor's examination is calculated as the weighted arithmetic mean of the module grades, with the weights for the individual grades being determined on the basis of the ECTS credits listed in Table 2.2 (German) or Table 2.4 (English).

3 Main studies

3.1 Subject

The courses in the main study programme are listed in Table 3.

Table 3: Subjects in the main study period

Semester	Course					Examination		Prerequisite		ECTS
	Module	No	Course title	Type	SWS	Type	Duration	Type	Duration	
3	H1	**612210**	**Mathematics 3, Signals and Systems**							
		612211	Mathematics 3	V/Ü	2	LK	60			2.5
		612212	Signals and Systems	V/Ü	2	LK	60			2.5
	H2	**612220**	**Materials Engineering** [1)]			LK	120			
		612221	Materials Engineering	V/Ü	4	Module exam				5
	H3	**612230**	**Laboratory Materials and Physics**							
		612231	Materials Laboratory	L/S	2			SL		2.5
		612232	Physics laboratory	L/S	2			SL		2.5
	H5	**612250**	**Thermodynamics**			LK	120			
		612251	Thermodynamics	V/Ü	4	Module exam				5
	H9	**612290**	**Designing with CAD**			LE				
		612291	Designing with CAD	V/Ü	4	Module exam				5
	H10	**612300**	**Construction 3**					SK	90	
		612301	Design 3	V/Ü	4			Module exam		5
Total 3rd semester					**24**	**5**		**3**		**30**

4	H6	**612260**	**Fluid mechanics**			LK	120			
		612261	Fluid mechanics	V/Ü	4	Module exam				5
	H7	**612270**	**Control engineering**			LK	120			
		612271	Control engineering	V/Ü	4	Module exam				5

	H8	**612280**	**Measurement Technology and Sensor Technology**			LK	120			
		612281	Measurement technology and sensor technology	V/Ü	4	Module exam				5
	H1	**612310**	**Construction 4**			LK	180			
		612311	Design 4	V/Ü	6	Module exam				5
	H12	**612320**	**Manufacturing processes**			PK	120			
		612321	Cutting and abrasive manufacturing processes	V/Ü	2	Module exam				2.5
		612322	Forming manufacturing processes	V/Ü	2	Module exam				2.5
	H1	**612340**	**Applied Product Development of Mechatronic Systems**			LL				
		612341	Applied Product Development of Mechatronic Systems	L/S	2	Module exam				5
Total 4th semester					**24**	**6**		**0**		**30**

5	H13	**612330**	**Practical study semester**							
		612331	Supervised practical phase		0			SA		26
		612332	Colloquium on the practical study semester	S	0			SR		4
Total 5th semester					**0**	**0**		**2**		**30**

6	H4	**612240**	**Vibration Theory and Machine Dynamics**			PK	120			
		612241	Vibration theory	V/Ü	2	Module exam				2.5
		612242	Engine dynamics	V/Ü	2	Module test				2.5
	H15	**612350**	**Project lab**			LL				
		612351	Project laboratory	L/S	2	Module exam				2.5
	H1	**612360**	**Seminar paper**			LE				
		612361	Seminar paper	L/S	1	Module exam				7.5
	H1	**612380**	**Specialisation 1**							
			Elective subject(s) in accordance with section 3.2	V/Ü/L	4	Lx				5
	H	**612390**	**Specialisation 2**							
			Elective subject(s) in accordance with section 3.2	V/Ü/L	4	Lx				5
	H	**612400**	**Specialisation 3**							
			Elective subject(s) in accordance with section 3.2	V/Ü/L	4	Lx				5
Total 6th semester					**19**	**6**		**0**		**30**

7	H17	**612370**	**Law and ethics**							
		612371	Law in Engineering	V/Ü	2	LK	60			2.5
		612372	Ethics	V/Ü	2			SR		2.5
	H21	**612410**	**Specialisation 4**							
			Elective subject(s) in accordance with section 3.2	V/Ü/L	4	Lx				5
	H2	**612420**	**Specialisation 5**							
			Elective subject(s) in accordance with section 3.2	V/Ü/L	4	Lx				5
	H23	**612430**	**Bachelor thesis / project**							
		612431	Project planning and colloquium	S	0	PA				3
		612432	Bachelor thesis		0	PB				12
Total 7th semester					**12**	**5**		**1**		**30**

1 Students in the English basic programme take 612121 *Design 2 with Strength of Materials* from the VF catalogue in the 3rd semester instead of 612221 *Materials Engineering*. In this case, the course 612221 *Materials Engineering* is taken in accordance with section 3.2 in module 612380 *Specialisation 1* from the VF catalogue.

3.2 Electives

To fulfil the **examination requirements for "Specialisation 1-3"**, students select technical electives totalling 15 ECTS from the VF catalogue. To fulfil the **examination requirements for "Specialisation 4-5",** technical electives totalling 10 ECTS are selected from the VF catalogue or the WF catalogue.

Students in **the English basic study programme** must take the subject 612221 *Materials Engineering* from the VF catalogue in module 612380 *Specialisation 1*.

The courses from the VF and WF catalogues are designed to enable students to deepen their studies. Students can choose specialisation areas here by successfully completing the elective courses assigned to the respective specialisation area. The assignment of each elective to one or more specialisations is indicated in the VF and WF catalogues and in the module handbook. Selected specialisations can be indicated on the transcript.

The VF and WF catalogues are part of the module handbook and are available on the programme homepage and the official digital learning platform of the university by the end of the previous semester at the latest. Subjects from another programme outside the faculty of Heilbronn University or another university may be recognised upon request. Participation in elective subjects may be limited due to capacity reasons.

Changes to the VF and WF catalogues are approved by the examination board upon request of the lecturer responsible for the course in question, after consultation with the faculty council and the study commission. The subjects offered must take into account the competence objectives of the degree programme and must correspond to at least level 6 of the German Qualifications Framework. Multiple crediting of subjects is not permitted.

3.3 Module exams in the main study period

The Module exams of the Bachelor's examination, the associated examination requirements and preliminary examination requirements, as well as the weighting of the grades for the individual examination requirements and the module grades and the Bachelor's thesis are shown in Table 4.

Table 4: Module exams for the Bachelor's examination, weighting of the grades for the individual examination components and module grades

Module grades for main studies: Mechanical Engineering (MB)					
Module	**No**	**Module name**			**Weighting of the module grade for the grade according to § 29**
		Examination performance	**No**	**Preliminary examination**	
Mathematical and scientific specialisation					
H1	**612210**	**Mathematics 3, Signals and Systems**			**5**
	612211	Mathematics 3			
	612212	Signals and Systems			
H2	**612220**	**Materials Engineering**			**5**
	612221	Materials engineering			
H3	**612230**	**Materials and Physics Laboratory**			**0**
			612231	Materials Laboratory	
			612232	Physics Laboratory	
H4	**612240**	**Vibration Theory and Machine Dynamics**			**5**
	612241	Vibration Theory			
	612242	Machine dynamics			
Thermal and fluid dynamics					
H5	**612250**	**Thermodynamics**			**5**
	612251	Thermodynamics			
H6	**612260**	**Fluid mechanics**			**5**
	612261	Fluid mechanics			
Measurement and control technology					
H7	**612270**	**Control engineering**			**5**
	612271	Control engineering			
H8	**612280**	**Measurement technology and sensor technology**			**5**
	612281	Measurement Technology and Sensor Technology			

Construction					
H9	**612290**	**Designing with CAD**			**5**
	612291	Designing with CAD			
H10	**612300**	**Design 3**			**0**
			612301	Design 3	
H11	**612310**	**Design 4**			**5**
	612311	Design 4			
Production engineering					
H12	**612320**	**Manufacturing Processes**			**5**
	612321	Cutting and abrasive manufacturing processes			
	612322	Forming manufacturing processes			
Practical study semester					
H13	**612330**	**Practical study semester**			**0**
			612331	Supervised practical phase	
			612332	Colloquium on the practical study semester	
Laboratory and seminar work					
H14	**612340**	**Applied product development of mechatronic systems**			**5**
	612341	Applied Product Development of Mechatronic Systems			
H15	**612350**	**Project laboratory**			**2.5**
	612351	Project laboratory			
H16	**612360**	**Seminar paper**			**7.5**
	612361	Seminar paper			
Technical Management					
H17	**612370**	**Law and Ethics**			**5**
	612371	Law in Engineering			
			612372	Ethics	
Elective and specialisation subjects					
H18	**612380**	**Specialisation 1**			**5**
		Elective subject(s) in accordance with section 3.2			
H19	**612390**	**Specialisation 2**			**5**
		Elective subject(s) in accordance with section 3.2			
H20	**612400**	**Specialisation 3**			**5**
		Elective subject(s) in accordance with section 3.2			
H21	**612410**	**Specialisation 4**			**5**
		Elective subject(s) in accordance with section 3.2			
H22	**612420**	**Specialisation 5**			**5**
		Elective subject(s) in accordance with section 3.2			
Bachelor's thesis					
H23	**612430**	**Bachelor thesis / project**			**15**
	612431	Project planning and colloquium			
	612432	Bachelor thesis			
Total					**110**

3.4 Bachelor's examination

The Bachelor's certificate contains the module grades for all modules listed in Table 4 and the Bachelor's thesis. If several performance assessments take place at the course level within a module (including elective modules), the module grade is determined according to a weighted arithmetic mean of the individual performances contained in the module in accordance with the ECTS. The overall grade on the Bachelor's certificate is calculated as the weighted arithmetic mean of the module grades and the grade for the Bachelor's thesis, with the weights for the individual grades being determined on the basis of the ECTS credits listed in Table 4.

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3.5 Admission requirements

The following admission requirements apply:

The admission requirement for admission to the German-language main study programme with a basic study programme in English is that module 612620 German Language and Academic Skills 2 has been passed at minimum language level B2 or equivalent. Proof of this must be provided by submitting one of the following certificates: DSH-1, Goethe B2, telc B2 (or comparable tests in accordance with the framework regulations for German language tests for studying at German universities). Passing the corresponding GER course level of a DaF course at the Centre for Studies and Teaching at Heilbronn University is also accepted as equivalent proof.

To participate in 612231 Materials Laboratory, 612040 Materials or 612600 Materials must have been passed.

To participate in 612232 Physics Laboratory, 612030 Physics or 612530 Physics must have been passed.

Successful participation in the practical study semester must be proven at the latest when the Bachelor's thesis is submitted.

3.6 Practical study semester

The requirements for crediting the practical study semester and the office responsible for crediting are regulated in the general section of these study and examination regulations (§§ 4, 7 para. 2).

During the practical study semester, students should apply the knowledge they have acquired to date in a supervised practical phase. They should carry out engineering or information technology tasks independently and with shared responsibility.

A practical study semester completed abroad is expressly desired.

3.7 Special regulations for Study PLUS models during the contract period between the cooperating company and the student

As part of their studies, Study-Plus students are required to complete additional practical work at their partner company during lecture-free and exam-free periods that are not used for statutory holiday entitlement. During these periods, the specialist knowledge acquired to date is applied and deepened in practice, and students gain intensive insight into the working conditions and methods of engineers.

Their engineering-related activities include working as independently and autonomously as possible, as well as working on and solving specific problems in the following areas:

- Development
- Laboratory, testing and test field
- Design and standardisation
- Production planning and control
- Production and assembly
- Quality assurance
- Project planning
- Technical sales
- or other relevant areas.

The focus is based on the company's capabilities and the content of the degree programme.

The level of the activities must be adapted to the individual progress of the programme so that the course content can be learned, applied and consolidated through in-depth practical knowledge.

4 Entry into force

These study and examination regulations (SPO 4) shall enter into force on 1 September 2025. Students who have already commenced their studies at the time of entry into force of these study and examination regulations shall complete the remaining examination requirements and preliminary examination requirements in accordance with the previous study and examination regulations (SPO 3).

Heilbronn, 30 April 2025

Signed
Prof. Dr.-Ing. Oliver Lenzen
Rector

Announcement

The examination regulations are hereby publicly announced in accordance with the announcement regulations of Heilbronn University of Applied Sciences dated 28 June 2017.

Heilbronn, 30 April 2025

For the Prorectorate for Learning and Teaching

Signed
Prof. Dr. Ulrich Brecht