Hochschule Aalen

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Study and examination regulations for the Bachelor degree program Mechatronics Engineering at Aalen University - Technology, Business and Health (BA-TB-EMC-34) dated June 5, 2025

Based on §§ 8 para. 5 in conjunction with §§19 para. 1 sentence 2 no. 9, § 32 para. 3 sentence 1 of the Law on Universities in Baden-Württemberg (Landeshochschulgesetz - LHG) in the version of January 1, 2005 (GBl. p.1), last amended by Article 24 of the Law of December 17, 2024 (GBl. 2024 No. 114), the Senate of Aalen University - Technology, Business and Health adopted the following statutes on May 21, 2025.

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§ 1 General

The provisions of the General Part of the Study and Examination Regulations for Bachelor's Degree Programs at Aalen University of Applied Sciences - Engineering, Business and Health dated 14 April 2025 (BA-AT), as amended, apply in addition to these regulations. In the event of any contradictions, these regulations take precedence.

§ 2 Qualification objectives

The Bachelor's degree program combines the technical disciplines of mechanics, electrical engineering and information technology. In addition, students acquire skills in the field of optics/photonics. The Bachelor's degree program is international, interdisciplinary and practice-oriented.

Graduates acquire the following skills:

- They are able to transfer basic mathematical, scientific and engineering knowledge and methods to applications in mechatronics and optoelectronics.
- They are able to design mechatronic systems and solve engineering and technical tasks.
- You will be able to generate, direct and detect light.
- They are able to determine and analyze system properties and system behavior of mechatronic systems using suitable measurement methods. They will be able to implement suitable measures for the targeted influencing of system behavior through control or regulation concepts.
- You will be able to combine relationships in different forms for mechatronic components and processes on the basis of the mechanical, electrical, electronic, optical and information technology levels and combine them into new systems.
- They can discuss mechatronic and optoelectronic problems in an interdisciplinary manner, develop solutions, document them and present them orally and in writing.
- You will have a high degree of creativity, communication and teamwork skills thanks to practical exercises in the laboratory and many internships and projects.
- Through projects and the Bachelor's thesis, they are able to independently work on a technical-scientific issue and present it in report form.
- They can communicate in the respective foreign languages German and English and work on technical tasks. In doing so, they are able to take intercultural particularities into account.

The ability to engage in civil society is anchored in the Studium Generale. Here, students acquire further soft skills and interdisciplinary competencies that are essential for personal development and for their future careers. Personal development also includes future roles in civil society, politics and culture. This enables graduates to discuss current and historical topics, critically reflect on social processes, develop an understanding of different perspectives and help shape them with a sense of responsibility and democratic community spirit.

Thanks to the broad-based, interdisciplinary education, graduates are qualified to work in a wide range of sectors, e.g. automation, drive and packaging technology, robotics, optoelectronics, environmental technology, the automotive industry, the information and telecommunications technology sector, medical technology, and in the sale of mechatronic or optoelectronic products. Occupational fields include, for example, development engineer for mechatronic or optical systems, mechatronics engineer, electronics technician for automation technology or information and systems technology, process mechanic, product manager in optoelectronics, system engineer in optoelectronics, project manager in medical technology, quality manager, system integration engineer and many more.

§ 3 Course structure and scope of studies

(1) The course comprises a total of 7 semesters, divided into 6 semesters of study and a practical semester in the 5th semester. The teaching and examination language is English.

(2) The practical semester (placement semester/internship) comprises one semester with at least 110 attendance days. Its aim is to consolidate the skills and competencies already acquired in the previous semesters of the curriculum and to deepen the focus on the required working techniques in the chosen industry, preferably with a mechatronic or photonic connection.

(3) As part of the compulsory elective area, four compulsory elective modules must be selected in semester 6 and one compulsory elective module in semester 7. These can be chosen from the fields of mechatronics, photonics or mechanical engineering. The degree program publishes a list of the modules offered in the compulsory elective area in good time before the start of each semester.

(4) Participation in at least three excursions during the course of study is compulsory.

(5) Upon application, students have the opportunity to complete coursework abroad in the 6th semester. The application must be submitted to the examination board of the degree program. The application must be approved if the student can provide suitable evidence that the stay abroad is organized in a way that is conducive to their studies. As part of the approval process, the examination board ensures that the competence objectives of the 6th semester can be achieved through the activities abroad. The Head of the Recognition Office decides on the recognition of these examinations taken abroad after consultation with the responsible lecturer at Aalen University of Applied Sciences - Engineering, Business and Health. A Learning Agreement must be agreed for the work to be completed abroad before the start of the stay abroad. If agreements exist with foreign universities on the mutual recognition of coursework and examinations, decisions will be made on the basis of these agreements. § Section 35 BA-AT remains unaffected. Failed credits are to be taken from the credits of the 7th semester.

(6) The duration and structure of the course, modules and partial credits with semester hours per week and the corresponding allocation of CP are shown in the table below. A rt and scope of the individual module contents and examinations are specified in the module handbook.

Curriculum

Study program Mechatronics Engineering - compulsory area

No.	**Module /** Course	Type	Semester hours per week / semester							CP
			1.	2.	3.	4.	5.	6.	7.	
87001	**Mathematics 1**						Placement Semester / Internship			**5**
87101	Mathematics 1	V, Ü	6							5
87002	**Material Science**									**5**
87102	Material Science	V	4							5
88001	**Engineering Mechanics 1**									**5**
88101	Engineering Mechanics 1	V	4							5
87003	**German as a Foreign Language 1 or Technical English 1**									**5**
87103	German as a Foreign Language 1 *	Ü, S	4							5
87104	Technical English 1 **	Ü, S	2							5
87004	**Computer Science 1**									**5**
87105	Computer Science 1	V, Ü	4							5
88002	**3D-CAX**									**5**
88102	CAD/CAE/CAM	V	2							
88103	3D-CAD	Ü, L	2							5
87005	**Mathematics 2**									**5**
87201	Mathematics 2	V, Ü		6						5
88003	**Electrical Engineering**									**5**
88201	Electrical Engineering	V, Ü, L		4						5
88004	**Engineering Mechanics 2**									**5**
88202	Engineering Mechanics 2	V, L		4						5
87006	**German as a Foreign Language 2 or Technical English 2**									**5**
87202	German as a Foreign Language 2 *	Ü, S		4						5
87203	Technical English 2**	Ü, S		2						5
87007	**Computer Science 2**									**5**
87204	Computer Science 2	V, Ü		4						5
88005	**Physics**									**5**
88203	Physics	V, Ü, L		4						5

87020	**Advanced Topics in Mathematics**									**5**
87601	Advanced Topics in Mathematics	V,Ü			**4**					5
87008	**Electrical Drive Technology**									**5**
87301	Electrical Drive Technology	V, Ü, P			4					5
87009	**Power Electronics**									**5**
87302	Power Electronics	V, Ü, P			4					5
87010	**Sensors and Data Acquisition**									**5**
87303	Sensors and Data Acquisition	V, Ü			5					5
87011	**Digital Technology**									**5**
87304	Digital Technology	V, Ü			4					5
87012	**Embedded Control Systems**									**5**
87305	Embedded control systems	V, Ü, L			4					5
87014	**System Dynamics**									**5**
87401	System Dynamics	V, Ü				4				5
87015	**Product Design**									**5**
87402	Product Design	V, Ü, P				4				5
87016	**Mechanical Design**									**5**
87403	Mechanical Design	V, Ü, P				4				5
87017	**Manufacturing Technology**									**5**
87404	Manufacturing Technology	V, Ü, P				4				5
87018	**Networks/Distributed systems**									**5**
87405	Networks/Distributed systems	V, Ü				4				5
88014	**Process Automation and Control**									**5**
88405	**Process Automation and Control**	V				4				5
88406	**Process Automation and Control - Lab**	L				1				
87555	**Placement Semester/Internship**									**30**
87555	Placement Semester/Internship									30

87019	**Human-Robot Interaction**									**5**
87406	Human-Robot Interaction	V, Ü, L						4		5
87021	**Mechatronics Project**									**5**
87602	Mechatronics Project	P						4		5
87026	**Machine and Deep Learning**									**5**
87701	Machine and Deep Learning	V, Ü							4	5
87027	**Control Engineering**									**5**
87702	Control Engineering	V, Ü, L							4	5
87999	**General studies**									**3**
87999	General studies								X	3
9999	**Bachelor Thesis**									**12**
9999	Bachelor Thesis								X	12
	Total SWS		**24/ 26**	**24/ 26**	**25**	**25**		**8**	**8 + SG[1] + BA[2]**	
	Total CP		**30**	**30**	**30**	**30**	**30**	**10**	**25**	
	Total examinations		**6**	**6**	**6**	**6**		**2**	**2 + SG[1] + BA[2]**	

[1]SG= Studium Generale, [2]BA= Bachelor thesis

* Compulsory module for international students at A1 level

** Compulsory module for domestic students at B2 level

Degree program Mechatronics Engineering - Compulsory elective area

No.	Module/Course	Type	Semester hours per week/ semester							CP
			1.	2.	3.	4.	5.	6.	7.	
Compulsory elective area										
87022	Elective subject EMC-1									**5**
87603	Elective subject EMC-1	3						X		5
87023	Elective subject EMC-2									**5**
87604	Elective subject EMC-2	3						X		5
87024	Elective subject EMC-3									**5**
87605	Elective subject EMC-3	3						X		5
87025	Elective subject EMC-4									**5**
87606	Elective subject EMC-4	3						X		5
87028	Elective subject EMC-5									**5**
87703	Elective subject EMC-5	3							X	5
	Total SWS		**24/26**	**24/26**	**25**	**25**		**8 + WP[4]**	**8 + WP[4] + SG[1] + BA[2]**	
	Total CP		**30**	**30**	**30**	**30**	**30**	**30**	**30**	
	Total examinations		**6**	**6**	**6**	**6**		**6**	**3 + SG[1] + BA[2]**	

[1]SG= Studium Generale, [2]BA= Bachelor's thesis, [3]= type of course depends on the choice of module, [4]WP= elective subject,

Optional international semester in the 6th semester
Achievements in the 6th semester can be completed abroad and recognized in accordance with the Learning Agreement; recognition is possible for a maximum of six of the following modules "International Module - Mechatronics Engineering 1 - 6".

No.	**Module /** Courses	Type	Semester hours per week / semester							CP
			1.	2.	3.	4.	5.	6.	7.	
87901	**International module - EMC 1**						Practical semester			**5**
87651	International Module - EMC 1							X		5
87902	**International Module - EMC 2**									**5**
87652	International Module - EMC 2							X		5
87903	**International module - EMC 3**									**5**
87653	International Module - EMC 3							X		5
87904	**International Module - EMC 4**									**5**
87654	International Module - EMC 4							X		5
87905	**International module - EMC 5**									**5**
87655	International Module - EMC 5							X		5
87906	**International Module - EMC 6**									**5**
87656	International module - EMC 6							X		5

§ 4 Entry into force

These statutes come into force on the day after their announcement and apply for the first time for the winter semester 2025/26. At the same time, the study and examination regulations for the Bachelor's degree program in Mechatronics Engineering at Aalen University (BA-TB-EMC-34) dated 31 October 2024 expire.

Aalen, June 5, 2025

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Prof. Dr. Harald Riegel

Rector