Study Plan FSPO 2025 (English)

MSc Biomedical Engineering

Status: 1.04.2026

Areas

The following module groups must be completed in the Master's degree program in Biomedical Engineering. A total of 90 credit points (ECTS) must be earned in module groups B and C. The conditions specified at the time of admission must also be respected.

Nr.	Bereich	ECTS
A	**Compulsory**	**30**
A1	Master's thesis	30
B	**Elective Compulsory**	**≥ 84**
B1	Core Engineering Sciences (ING)	≥ 16
B2	Core Biomedical Engineering (BMT)	≥ 18
B3	Core Health Sciences(HEALTH)	≥ 9
B4	Specialization	≥ 15
B5	Seminar	≥ 5
B6	Practical	≥ 10
C	**Complementary**	**≥ 6**
Sum		**≥ 120**

Specializations

It is possible to structure your studies according to a specialization. If all the requirements are fulfilled by the end of the program, you will receive confirmation that you have successfully completed the specialization. At least 30 ECTS must be earned within the specialization. The modules assigned to each specialization can be found in the study plan. The specialization is defined by the advanced modules, as well as the associated seminar and practical module, but not by the core modules. However, core modules may be prerequisites for certain advanced modules. Regardless of the chosen specialization, the requirements of the study plan must always be followed.

Aktuelle Schwerpunkte sind:

Sensors & Systems (S&S)
Sensors and sensor systems are essential components of modern biomedical engineering and drive innovation in numerous fields. They enable the precise measurement of physical and physiological parameters and the automatic control of complex processes.
Signals, Data, & Algorithms (SDA)
Signal processing techniques allow measurements to be captured precisely and, through specialized algorithms, structured, interpreted, and transformed into usable information. Artificial intelligence also plays a crucial role in this process.

Core (B1-B3)

At least 16 ECTS must be earned in the Core Engineering Sciences (B1), at least 18 ECTS in the Core Biomedical Engineering (B2), and at least 9 ECTS in the Core Health Sciences (B3). Core modules may also be assigned as advanced modules to specializations. If they are counted toward the core B1-B3, they cannot simultaneously be credited toward the Specialisation B4, and vice versa.

Specialisation (B4)

At least 15 ECTS must be selected from the area designated for this purpose in the study plan.

Seminar (B5)

One of the modules designated for this purpose in the study plan must be selected. Only one seminar module can be credited toward the elective compulsory area.

Practical (B6)

One of the modules designated for this purpose in the study plan must be selected. Only one practical module can be credited toward the elective compulsory area.

Ergänzungsmodule (C)

Modules must be chosen from the course offerings of Ulm University outside the Faculty of Engineering Sciences.

The remaining 11 ECTS in the elective compulsory area, which are not further specified, can be earned from areas B1 to B4.

Further information and FAQs about the Biomedical Engineering (BMT) program can be found at www.uni-ulm-de/studium-bmt .

ID	Modul TEST	ECTS	SWS	Sprache D	Sprache E	Semester S	Semester W	Sensors & Systems (S&S)	Signals, Data, & Algorithms (SDA)
A PFLICHTBEREICH									
	Masterarbeit	30	-						
C ERGÄNZUNGSBEREICH									
	Verschiedene	6	-						
B1 KERN INGENIEURWESEN (ING)									
75264	Automatisierungstechnik	6	4						
75655*	Bio-inspirierte Sensorik für Implantate und autonome (kognitive)	6	4						
72270	Digital Communications	7	6						
72269	Integrierte Analogschaltungen	6	4						
75027	Introduction to Deep Learning	5	4						
74212	Learning Systems I: Introduction to Machine Learning	6	4						
75683*	Neuromorphic Engineering: Bio-inspired Sensing	6	4						
72019	Sicherheit in IT-Systemen	6	4						
76597	Softwaretechnik	6	4						
B2 KERN BIOMEDIZINISCHE TECHNIK (BMT)									
75312	Appropriate Medical Device Design	4	3						
72138	Bioinformatics & Systemsbiology	6	4						
NEU	Biomedizinische Anwendungen der Hochfrequenz-Sensorik	6	4						
76681	Biophysics Lecture Series	6	5						
75747	Biosensoren	6	4						
75335	Medical Wearables I	5	4						
74257	Neurotechnology: Brain-Machine-Interfacing	6	4						
B3 KERN GESUNDHEITSWISSENSCHAFTEN (HEALTH)									
75395	Hormonphysiologie	3	2						
73222	Humangenetik	3	2						
74247	Introduction to Psychological Methods and Statistics for Non-Psy	6	4						
76568	Störungs- und Verfahrenslehre I im Nebenfach	4	2						
76688	Störungs- und Verfahrenslehre II im Nebenfach	4	2						
73704	Pharmakologie und Toxikologie I	3	2						
	TBD	3	2						
	TBD	3	2						
B5 SEMINARBEREICH									
75745	Seminar Research Trends in Biomedical Sensors & Systems	5	3						
NEU	Seminar Research Trends in Biomedical Signals, Data & Algorith	5	3						
B6 PRAXISBEREICH									
NEU	Project Biomedical Sensors and Systems	10	7						
NEU	Project Biomedical Signals, Data, & Algorithms	10	7						

* Nur 1 Modul wählbar / Only 1 module selectable

ID	Modul	ECTS	SWS	Sprache D	Sprache E	Semester S	Semester W	Sensors & Systems (S&S)	Signals, Data, & Algorithms (SDA)
B4 VERTIEFUNGSBEREICH									
75139	Active Optoelectronic Devices	6	4						
75206	Advanced Methods in Data Mining and Machine Learning	6	4						
70451	Advanced Optoelectronic Communication Systems	6	4						
75618	Angewandte Biomechanik und Orthopädische Forschung	5	3						
75746	Bioelectronics	6	4						
76687	Biologische Psychologie im Nebenfach	8							
71502	Biophotonik	6	6						
Neu	Biosensor and microsystems technology	5	4						
Neu	Causal Inference	5	4						
74225	Dependable Embedded Systems	6	4						
70474	Echtzeitsysteme in Robotik und Regelungstechnik	6	4						
75687	Einführung in die Mikro- und Nanotechnologien	5	4						
70443	Einführung in die Optoelektronik	6	4						
70414	Filter- und Trackingverfahren	6	4						
74004	Gene Expression	3	2						
	Global/Planetary Health	2	2						
71405	Identifikation dynamischer Systeme	5	3						
75640	Information Theory	8	4						
75166	Integrated High-Frequency Circuits	6	4						
72274	Integrated Interface Circuits	6	4						
75276	Introduction to Quantum Engineering	4	2						
75674	Machine Learning & Security	6	4						
75551	Materials Science I	5	4						
75552	Materials Science II	5	4						
NEU	Mechanophysics	3	2						
71406	Modellbildung dynamischer Systeme	5	3						
74003	Molecular Motors	3	2						
74586	Pattern recognition	6	4						
74094	Privacy Engineering and Privacy Enhancing Technology	6	4						
75481	Quantum Sensing I	3	2						
74176	Softwarequalitätssicherung	6	4						
74627	Spezifikation eingebetteter Systeme	6	4						
70411	Systemtheorie	7	5						
74764	Terahertz Sensors	5	3						
70625	Thin Films	4	2						