Module Catalog Master Program Medical Engineering - Valid from FPO version 2022 & 2023
Study Field "Medical Robotics"

Please note the Module Descriptions in Campo!

Module Group	Module Number	Modules / Module Name (Name of Lecture)	Abbr.	SWS L+E+S+P	Total Sum ECTS	1st Year WS ECTS	1st Year SS ECTS	2nd Year WS ECTS	2nd Year SS ECTS	Language	Course Achievement Modalities		Responsible Chair(s)	WS/SS
M 1		**Medical Specialization**		**L+E+S+P**	**10**	**5**	**5**	**0**	**0**					
	M 1.1 [1]	Fundamentals in Anatomy and Physiology for Engineers	OMED/FAP	4+0+0+0	5	0	5	0	0	EN	gCA	MED	Lehrstuhl für Anatomie II (Prof. Dr. Paulsen)	SS
	M 1.2	Applications of nanotechnology in cardiovascular diseases	HNO 18	0+0+2+0	2,5	0	2,5	0	0	EN	gCA	MED	Lehrstuhl für Hals-, Nasen- und Ohrenheilkunde	WS/SS
	M 1.3	Medizinische Biotechnologie / Medical Biotechnology	MBT	3+1+0+0	5	0	5	0	0	EN	gCA	CBI	Lehrstuhl für Medizinische Biotechnologie (MBT)	SS
	M 1.4	Introduction to medical physics in radiation therapy	MEDPHYS-I	2+0+0+0	2,5	2,5	0	0	0	EN	gCA	MED	Lehrstuhl für Strahlentherapie	WS
	M 1.5	Lab class on medical physics in radiation therapy	MEDPHYS-III	0+0+0+2	5	0	5	0	0	EN	gCA	MED	Lehrstuhl für Strahlentherapie	SS
	M 1.6	Introduction to Medical Physics II	MEDPHYS-II	2+0+0+0	2,5	0	2,5	0	0	EN	gCA	MED	Lehrstuhl für Strahlentherapie	SS
	M 1.7	Medical Physics in Nuclear Medicine	MPNM	2+0+0+0	2,5	2,5	0	0	0	EN	gCA	MED	Lehrstuhl für Klinische Nuklearmedizin	WS
	M 1.8	Jüngste Entwicklungen der medizinischen Systembiologie / Advances in Medical Systems Biology	AdvMedSys	0+0+3+0	2,5	0	2,5	0	0	EN	PfE	MED	Lehrstuhl für Haut- und Geschlechtskrankheiten	SS
	M 1.9	Introduction to simulation, network and data analysis in Medical Systems Biology	IntSysMed_f_Eng	2+0+0+0	5	5	0	0	0	EN	gCA	MED	Lehrstuhl für Haut- und Geschlechtskrankheiten	WS

			L+E+S+P											
M 1.10	Introduction to simulation, network and data analysis in cancer and oncotherapy	OncoSys_f_Eng	2+0+0+0	2,5	0	2,5	0	0	EN	gCA	MED	Lehrstuhl für Haut- und Geschlechtskrankheiten	SS
M 1.11	Ethics and Philosophy of AI		2+0+0+0	5	5	0	0	0	EN	gCA	PHIL	Lehrstuhl für Theory and Ethics of Artificial Intelligence (Alexander von Humboldt-Professur)	WS
M 1.12	Systems Immunology and Infectiology	SYSImInf	2+2+0+0	5	0	5	0	0	EN	gCA	MED	Lehrstuhl für Hämatologie / Internistische Onkologie	SS
M 1.13	Medical Device Regulation	MDR	0+0+2+0	2,5	2,5	0	0	0	EN	gCA	FAU MT	Profilzentrum Medizintechnik	WS/SS
M 1.14	Movement neuroscience: connections between the brain and muscles in humans Exercise **No longer offered from SS 26**	MNeuro	2+1+0+0	5	5	0	0	0	EN	gCA	AIBE	Juniorprofessur für Neuromuscular Physiology and Neural Interfacing	WS

[1] Obligatory, if appropriate skills not acquired in the Bachelor program

Additional medical modules can be used with the agreement of the program director. Please consult with your study advisor beforehand.

M 2	**Engineering Core Modules**		L+E+S+P	20									
M 2.1	Mechatronic Components and Systems Exercise	MCS	2+2+0+0	5	0	5	0	0	EN	gCA	EEI	Lehrstuhl für Autonome Systeme und Mechatronik	SS
M 2.2[1]	Robotics 1 Exercise	ROB1	2+2+0+0	5	0	5	0	0	EN	gCA	EEI	Lehrstuhl für Regelungstechnik	SS
M 2.3	Robotics 2 Exercise	ROB2	2+2+0+0	5	5	0	0	0	EN	gCA	EEI	Lehrstuhl für Regelungstechnik	WS
M 2.4	Robot Mechanisms and User Interfaces Exercise	RMI	2,5+2,5+0+0	5	5	0	0	0	EN	gCA	EEI	Lehrstuhl für Autonome Systeme und Mechatronik	WS
M 2.5	Deep Learning	DL	2+2+0+0	5	5	0	0	0	EN	gCA	INF	Lehrstuhl für Informatik 5	WS/SS
M 2.6	Robotics Frameworks	RoF	2+2+0+0	5	5	0	0	0	EN	gCA	MB	Lehrstuhl für Fertigungsautomatisierung und Produktionssystematik	WS
M 2.7	Empirical Research Methods in Medical Engineering	EmpReMed	2+2+0+0	5	0	5	0	0	EN	gCA	AIBE	Professur für Robotische Planung und Kognition in der Chirurgie	SS
M 2.8	Computational multibody dynamics (formely "Computational Dynamics for Robotics") **Now offered in SS 26**	CDR	2+2+0+0	5	0	5	0	0	EN	gCA	MB	Lehrstuhl für Technische Dynamik	SS

[1] Obligatory, if appropriate skills not acquired in the Bachelor program

M 3		Medical Engineering Core Modules		L+E+S+P	20									
	M 3.1	Human-centered Mechatronics and Robotics Exercise	HMR	2+2+0+0	5	0	5	0	0	EN	gCA	EEI	Lehrstuhl für Autonome Systeme und Mechatronik	SS
	M 3.2	Rehabilitation and Assistive Robotics	RAR	2+2+0+0	5	0	5	0	0	EN	gCA	AIBE	Professur für Assistive Intelligente Robotik	SS
	M 3.3	Human-robot-co-adaption	HRC	3+1+0+0	5	5	0	0	0	EN	gCA	AIBE	Professur für Assistive Intelligente Robotik	WS
	M 3.4	AI in Medical Robotics	AIMedRob	3+1+0+0	5	5	0	0	0	EN	gCA	AIBE	Professur für Intelligente Sensomotorische Systeme	WS
	M 3.5	Interfacing the Neuromuscular system: Applications for Human/Machine Interfaces and Neurophysiology **Now offered in WS**	INS	3+0+0+0	5	0	5	0	0	EN	gCA	AIBE	Juniorprofessur für Neuromuscular Physiology and Neural Interfacing	WS
	M 3.6	Robotics in Surgery and Diagnostics		2+2+0+0	5	0	5	0	0	EN	gCA	AIBE	Surgical Planning and Robotic Cognition Lab (SPARC)	SS

M 4	Advanced Seminar Medical Engineering		L+E+S+P	5	0	0	5	0					
	Advanced Seminar Medical Engineering		0+0+2+0	5	0	0	5	0	EN	SA		see Seminar Catalogue	WS/SS

M 5		Medical Engineering Specialization Modules		L+E+S+P	10									
	M 5.2	Cognitive Neuroscience for AI Developers Exercise **Currently not offered**	CNAID	4+0+0+0	5	0	5	0	0	EN	gCA	INF	Juniorprofessur für Artificial Intelligence in Communication Disorders (Prof. Andreas Kist)	SS
	M 5.3	Body Area Communications	BAC	2+0+0+0	2,5	0	0	2,5	0	EN	gCA	EEI	Lehrstuhl für Technische Elektronik (LTE)	WS
	M 5.4	Human Computer Interaction Exercise	HCI	3+1+0+0	5	0	5	0	0	EN	gCA	INF	Lehrstuhl für Maschinelles Lernen und Datenanalytik (MaD)	SS
	M 5.5	Geometric Numerical Integration Exercise	GNI	2+2+0+0	5	0	5	0	0	EN	gCA	MB	Lehrstuhl für Technische Dynamik	SS

	Module	Title	Abbr	L+E+S+P						Lang	Exam	Dept	Chair	Sem
	M 5.6	Photonics in Medical Technology (formerly "Lasers in Healthcare Engineering")	PIH	2+2+0+0	5	0	0	5	0	EN	gCA	MB	Lehrstuhl für Photonische Technologien (LPT)	WS
	M 5.7	Intent Detection and Feedback	IDF(L)	2+2+0+0	5	0	5	0	0	EN	gCA	AIBE	Professur für Assistive Intelligente Robotik	SS
	M 5.8	Sensorimotor Neuroprosthetics **New from SS 26**	SmN	2+2+00	5	0	5	0	0	EN	PL	MED	Professur für Digital Health	WS/SS
	M 5.9	Computational Neural Engineering **New from SS 26**	CNE	2+2+00	5	0	5	0	0	EN	PL	MED	Professur für Digital Health	WS/SS
	M 5.10	Computational Neurotechnology	Neurotech	2+2+0+0	5	0	5	0	0	EN	gCA	AIBE	Professur für Sensorische Neurotechnologie	SS

	Module	Title	Abbr	L+E+S+P						Lang	Exam	Dept	Chair	Sem
M 6		**Medical Engineering Practical Modules**		**L+E+S+P**	**10**	**0**	**0**	**10**	**0**					
	M 6.1	Academic Laboratory See list on the study program website		0+0+0+4	5	0	0	5	0	EN	uCA			WS/SS
	M 6.2	Research Laboratory See information on the study program website, and additionally:		0+0+0+4	5	0	0	5	0	EN	uCA			WS/SS
	M 6.1 + M 6.2	**Combinations of M 6.1 and M 6.2:**												
		Project Pattern Recognition	ProjME	0+0+0+8	10	0	0	10	0	EN	uCA	INF	Lehrstuhl für Informatik 5 (Mustererkennung)	WS/SS
		Project Computer Vision	ProjCV	0+0+0+8	10	0	0	10	0	EN	uCA	INF	Lehrstuhl für Informatik 5 (Mustererkennung)	WS/SS
		Projekt Maschinelles Lernen und Datenanalytik / Project Machine Learning and Data Analytics	ProjMAD	0+0+0+8	10	0	0	10	0	GER/EN	uCA	AIBE	Lehrstuhl für Maschinelles Lernen und Datenanalytik (MaD)	WS/SS
		Project Biomedical Network Science	BIONETS	0+0+0+4	10	0	0	10	0	EN	uCA	AIBE	Professur für Biomedical Network Science	WS/SS
		Project Representation Learning	PRL	0+0+0+4	10	0	0	10	0	EN	uCA	AIBE	Professur für Image Data Exploration and Analysis	WS/SS
		Computational Imaging Project	Comp Imag Proj	0+0+0+8	10	0	0	10	0	GER/EN	uCA	AIBE	Professur für Computational Imaging	WS/SS

	Module	Abbr.	SWS	ECTS					Lang	Exam	Fac	Chair	Sem
	The AMOS Project	OSS-AMOS-SD	2+0+0+6	10	0	0	10	0	EN	uCA	INF	Professur für Open Source Software	WS/SS
	Biomedical Image Analysis Project	BIMAP	0+0+0+4	10	0	10	0	0	EN	uCA	AIBE	Juniorprofessur für Artificial Intelligence in Communication Disorders	SS
	Research Project on Surgical Robotics		0+0+0+4	10	0	0	10	0	EN	uCA	AIBE	Professur für Robotische Planung und Kognition in der Chirurgie	WS/SS
	Project Reproduce Research Results			10	0	0	10	0	EN	uCA	INF	Lehrstuhl für Mustererkennung (LME)	WS/SS
	Project Systems Immunology	Pr_SYSIm	0+0+0+3	10	0	0	10	0	EN	uCA	MED	Lehrstuhl für Hämatologie / Internistische Onkologie	WS/SS
	Medical Image Segmentation Project **New from SS 26**	MISProj	0+0+0+2	10	0	10	0	0	EN	uCA	AIBE	Juniorprofessur für Artificial Intelligence in Biomedical Engineering	WS/SS
	Computational Medicine Project		0+0+0+4	10	0	10	0	0	GER/EN	uCA	MED	Professur Computational Medicine	SS
	Neurotechnology Project	Neurotech Project	0+0+0+8	10	0	0	10	0	EN	uCA	AIBE	Professur für Sensorische Neurotechnologie	WS/SS

M 7	**Flexible Budget Faculty of Engineering**			10	0	0	10	0					
	Flexible Budget Faculty of Engineering any **graded** module on Master's level offered by the Faculty of Engineering									gCA		only graded modules of the Faculty of Engineering on Master's level (no conditional subjects)	
	Apart from all graded modules on Master's level offered by the Faculty of Engineering, the following modules from the Faculty of Economics can be used for M7:												
M 7.1	Innovation and Leadership	InnLead	4+0+0+0	5	0	0	5	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	WS
M 7.2	Service Innovation	ServInn	4+0+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	SS
M 7.3	Designing Technology Exercise	InnTec	2+2+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	SS

M 7.4	Organizing Digital Transformation		2+0+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere	SS
M 7.5	Implementing Innovation consisting of:			5									WS+SS
	Digital Innovation: Platforms and Systems for Innovation	IS III	1+1+0+0	2,5	0	2,5	0	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	SS
	Innovation Design		2+0+0+0	2,5	2,5	0	0		EN	gCA	WiSo		WS/SS
M 7.6	Fundamentals of Intercultural Communication		2+0+0+0	5	5	0	0	0	EN	gCA	VHB	Virtuelle Hochschule Bayern	SS/WS
M 7.7	Technology and Innovation Management	TIM	2+2+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Betriebswirtschaftslehre, insbesondere Industrielles Management	SS
M7.8	Innovation & Transformation		2+0+0+0	5	0	0	5	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	WS

M 8	Free Choice Uni			5	5	0	0	0					
	Free Choice Uni any **graded** lecture / course at the university			5	5	0	0	0		gCA		graded modules of all Faculties	

M 9	Master's Thesis			30	0	0	0	30					
M 9.1	Master's Thesis			27,5	0	0	0	27,5		PfE		see information on the study program website	
M 9.2	Advanced Seminar Master's Thesis			2,5	0	0	0	2,5					

For M3, you can use modules with a value of max. 5 ECTS credits from the module groups M2 and M5 of your own branch of study or from M2, M3 and M5 of the other branches of study

For M5, you can use modules with a value of max. 5 ECTS credits from the module groups M2 and M3 of your own branch of study or from M2, M3 and M5 of the other branches of study

All lectures can be complemented by additional exercises and practical courses.

L	Lecture	**PfE**	Portfolio Examination
E	Exercise	**gCA**	graded Course Achievement
S	Seminar	**uCA**	ungraded Course Achievement
P	Practical course/lab course	**SA**	Seminar Achievement (usually presentation and written report)
ws	Winter Term	**w**	written
ss	Summer Term	**o**	oral
		online	online (Virtual University Bavaria, VHB, www.vhb.org)

It is possible that in rare cases the exam type is changed. This information must be communicated to the students no later than two weeks after the start of the lecture period and must be documented in the module description in Campo.

BESCHLUSS Stuko – 02.12.2025