Module Catalog Master Programme Medical Engineering - Valid from FPO version 2022

Branch of Study "Medical Robotics"

Please note the Module Descriptions in UnivIS!

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	Department	Responsible Chair(s)	WS/SS
M 1	**Medical Specialisation**			**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	Professur für Nanomedizin (Stiftungsprofessur der Else Kröner-Fresenius-Stiftung)	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	Special topics of medical physics in radiation therapy	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	2,5	2,5	0	0	0	EN	gCA	MED	Lehrstuhl für Haut- und Geschlechtskrankheiten	WS

M 1.10	Systems Oncology: bioinformatics and computer modelling in cancer	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	Seminar Ethics of Engineering	EthEng	2+0+0+0	2,5	2,5	0	0	0	EN	gCA	ZiWiS	Zentralinstitut für Wissenschaftsreflexion und Schlüsselqualifikationen (ZiWiS)	WS
M 1.12	Medical Device Regulation	MDR	0+0+2+0	2,5	2,5				EN	gCA	ZiMT	Zentralinstitut für Medizintechnik	WS/SS
M 1.13	Movement neuroscience: connections between the brain and muscles in humans Exercise	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 programme

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	Robotics 1 (Control Fundamentals) Exercise	ROB1	2+2+0+0	5		5			EN	gCA	EEI	Lehrstuhl für Regelungstechnik	SS
M 2.3	Machine Learning for Engineers; Introduction to Methods and Tools Exercise	MLE1	2+2+0+0	5	5				EN	gCA	VHB	Virtuelle Hochschule Bayern	WS/SS
M 2.4	Inertial Sensor Fusion Exercise	ISF	2+2+0+0	5	5	0	0	0	EN	gCA	AIBE	Lehrstuhl für Daten, Sensoren und Geräte	WS
M 2.5	Robot Mechanisms and User Interfaces Exercise	RMI	2,5+2,5+0+0	5	5				EN	gCA	EEI	Lehrstuhl für Autonome Systeme und Mechatronik	WS
	more modules to be added for WS 22/23												

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		5			EN	gCA	EEI	Lehrstuhl für Autonome Systeme und Mechatronik	SS
M 3.2	Rehabilitation and Assistive Robotics	RAR	2+2+0+0	5		5			EN	gCA	AIBE	Professur für Medizinrobotik	SS
	more modules to be added for WS 22/23												

M 4	**Advanced Seminar Medical Engineering**		**L+E+S+P**	**5**	**0**	**0**	**5**	**0**					
	Advanced Seminar Medical Engineering		0+0+2+0	5			5		EN	SA		see Seminar Catalogue	WS/SS
M 5	**Medical Engineering Specialisation Modules**		**L+E+S+P**	**10**									
M 5.1	Advanced Upper-Limb Prosthetics Exercise	ULP	2+2+0+0	5	5				EN	gCA	AIBE	Professur für Medizinrobotik	WS
M 5.2	Machine Learning for Engineers II: Advanced Methods	MLE2	2+0+0+0	2,5					EN	gCA	AIBE	Lehrstuhl für Maschinelles Lernen und Datenanalytik	WS/SS
M 5.3	Cognitive Neuroscience for AI Developers Exercise	CNAID	4+0+0+0	5	0	5	0	0	EN	gCA	INF	Lehrstuhl für Informatik 5 (Mustererkennung)	WS/SS
M 5.4	Body Area Communications	BAC	2+0+0+0	2,5	2,5				EN	gCA	EEI	Lehrstuhl für Technische Elektronik (LTE)	WS
M 5.5	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 5.6	Geometric Numerical Integration Exercise	GNI	2+2+0+0	5		5			EN	gCA	MB	Lehrstuhl für Technische Dynamik	SS
M 5.7	Lasers in Healthcare Engineering	LASHE	2+0+0+0	2,5	2,5				EN	gCA	MB	Lehrstuhl für Photonische Technologien (LPT)	WS
M 5.8	Intent Detection and Feedback	IDF(L)	2+2+0+0	5		5			EN	gCA	AIBE	Professur für Medizinrobotik	SS
M 5.9	Computational Neurotechnology	Neurotech	2+2+0+0	5	0	5		0	EN	gCA	AIBE	Professur für Sensorische Neurotechnologie	SS
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		Zentralinstitut für Medizintechnik (ZiMT)	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		Lehrstuhl für Informatik 5 (Mustererkennung)	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			10		EN	uCA		Lehrstuhl für Informatik 5 (Mustererkennung)	WS/SS
	Project Computer Vision	ProjCV	0+0+0+8	10			10		EN	uCA		Lehrstuhl für Informatik 5 (Mustererkennung)	WS/SS
	Project Innovationslabor für Wearable und Ubiquitous Computing	InnoLabPro	0+0+0+4	10			10		EN	uCA		Lehrstuhl für Maschinelles Lernen und Datenanalytik (MaD)	WS/SS

Project Machine Learning and Data Analytics	ProjMAD	0+0+0+8	10			10		DE/EN	uCA		Lehrstuhl für Maschinelles Lernen und Datenanalytik (MaD)	WS/SS
Virtual and Augmented Reality	VRAR	2+0+0+6	10	0	10	0	0	EN	uCA		Juniorprofessur für Human-Centered Computing and Extended Reality	SS
Project Biomedical Network Science	BIONETS	0+0+0+4	10	0	10	0	0	EN	uCA		Juniorprofessur für Daten, Sensoren und Geräte / Digitale Transformation	WS/SS
Project Representation Learning	PRL	0+0+0+4	10	0	10	0	0	EN	uCA		Juniorprofessur für Daten, Sensoren und Geräte / Digitale Transformation	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			0	0	0		0		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:												
Innovation and Leadership	InnLead	4+0+0+0	5	0	0	5	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	WS
Service Innovation	ServInn	4+0+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	SS
Designing Technology Exercise	InnTec	2+2+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Wirtschaftsinformatik, insbesondere Innovation und Wertschöpfung	SS
Technology and Innovation Management	TIM	2+2+0+0	5	0	5	0	0	EN	gCA	WiSo	Lehrstuhl für Betriebswirtschaftslehre, insbesondere Industrielles Management	SS

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 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 (mostly taught in German!)

For M5, you can use 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 (mostly taught in German!)

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

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 UnivIS.

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

BESCHLUSS Stuko – 09.02.2022