

Module Catalog Master Program Medical Engineering

Study Field "Medical Image and Data Processing"

Modul Group	Modul Number	Modules		SWS	Total Sum	1st Year		2nd Year		Credit Modalities	Department	Lecturer / Responsible Person	WT/ST		
		Modul Name (Name of Lecture)	Abbr.			L+E+S+P	ECTS	WT	ST					WT	ST
								ECTS	ECTS					ECTS	ECTS

M 1	Medical Qualification Module			L+E+S+P	10	5	5	0	0	gCA			
M 1.1	Clinical Applications of Optical Technologies and Associated Fundamentals of Anatomy ¹	OMED/CA	4+0+0+0	5	0	5	0	0	45 o	MED	Prof. Dr. med. Michael Eichhorn	ST	
M 1.2	Epidemiology / Public Health (VHB)		2+0+0+0	2,5	2,5	0	0	0	online, uCA	MED	Prof. Dr. Katja Radon	WT/ST	
M 1.3	Advanced Occupational Safety and Health (VHB)		2+0+0+0	2,5	2,5	0	0	0	online, uCA	MED	Prof. Dr. med. Hans Drexler	WT/ST	
M 1.4	Applications of Nanotechnology in Cardiovascular Diseases	HNO 24	0+0+2+0	2,5	0	2,5	0	0	gCA	MED	Prof. Dr. med. Christoph Alexiou, PD Dr. habil. med. Iwona Cicha	ST	
M 1.5	Medizinische Biotechnologie / Medical Biotechnology	MBT	3+1+0+0	5	0	5	0	0	120 w	MED	Prof. Dr. med. habil. Dr. rer. nat. Oliver Friedrich	ST	

M 2	Engineering Science Core Module			L+E+S+P	20	10	10	0	0	gCA			
M 2.9	Digitale Signalverarbeitung / Digital Signal Processing Exercise	DSV	3+1+0+0	5	5	0	0	0	90 w	EEL	Prof. Dr.-Ing. Walter Kellermann	WT	
M 2.10 ¹	Pattern Recognition	PR	3+0+0+0	5	5	0	0	0	30 o	INF	Prof. Dr.-Ing. Joachim Hornegger	WT	
M 2.11 ¹	Pattern Analysis	PA	3+0+0+0	5	0	5	0	0	30 o	INF	Prof. Dr.-Ing. Elmar Nöth	ST	
M 2.12	Statistische Signalverarbeitung / Statistical Signal Processing Exercise	STASIP	3+1+0+0	5	0	5	0	0	90 w	EEL	Prof. Dr.-Ing. Walter Kellermann	ST	
M 2.21	Channel Coding Exercise	ChCo	3+1+0+0	5	0	5	0	0	90 w	EEL	Dr.-Ing. Clemens Stierstorfer	ST	
M 2.23	Geometric Modeling Exercise	GM	3+1+0+0	5	5	0	0	0	30 o	INF	Prof. Dr. Günther Greiner, Prof. Dr.-Ing. Marc Stamminger, Dr. Roberto Grosso	WT	

M 2.24	Applied Visualization Exercise	AppVis	2+2+0+0	5	0	5	0	0	30	o	INF	PD Dr.-Ing. Peter Hastreiter	ST
M 2.25	Transformationen in der Signalverarbeitung / Transformations in Signal Processing	TSV	2+0+0+0	2,5	0	2,5	0	0	30	o	EEL	Dr.-Ing. Jürgen Seiler	ST
M 2.26	Principles of Programming Languages Exercise	inf2-popl	2+2+0+0	2,5	0	2,5	0	0	30	o	INF	PD Dr. Ronald Veldema	ST
M 2.27	Dependable Embedded Systems (currently not offered!) Exercise	DES	2+2+0+0	5	5	0	0	0	30	o	INF	Prof. Dr.-Ing. Michael Glaß	WT
M 2.28	Elementary Numerical Mathematics Exercise	EINuMa	4+2+0+0	7,5	7,5	0	0	0	60	w	INF	Prof. Dr. Gerhard Wellein	WT
M 2.29	Algorithms of Numerical Linear Algebra Übung	ANLA	4+2+0+0	7,5	7,5	0	0	0	90	w	INF	Prof. Dr. Christoph Pflaum	WT
M 2.30 ²	Functional Analysis for Engineers Übung	FuncAnEng	2+2+0+0	5	5	0	0	0	60	w	INF	Prof. Dr. Christoph Pflaum	ST

¹ Obligatory, if appropriate skills not acquired in the Bachelor.

² Very profound knowledge of mathematics required.

M 3 Medical Engineering Core Module			L+E+S+P	20	10	10	0	0	gCA				
M 3.1	Visual Computing in Medicine	VCMed	4+0+0+0	5	2,5	2,5	0	0	30	o	INF	PD Dr.-Ing. Peter Hastreiter, PD Dr. Thomas Wittenberg	WT+ST
M 3.2	Diagnostic Medical Image Processing	DMIP	3+0+0+0	5	5	0	0	0	30	o	INF	Prof. Dr.-Ing. habil. Andreas Maier	WT
M 3.3	Interventional Medical Image Processing	IMIP	3+0+0+0	5	0	5	0	0	30	o	INF	Prof. Dr.-Ing. habil. Andreas Maier	ST
M 3.4	Biomedizinische Signalanalyse / Biomedical Signal Analysis Exercise	BioSig	2+2+0+0	5	5	0	0	0	90	w	INF	Prof. Dr. Björn Eskofier	WT
M 3.5	Computer Architectures for Med. Applications Exercise	CAMA	2+2+0+0	5	0	5	0	0	30	o	INF	Prof. Dr.-Ing. Dietmar Fey, Prof. Dr. Gerhard Wellein	ST
M 3.7	Image and Video Compression Exercise	IVC	3+1+0+0	5	0	5	0	0	90	w	EEL	Prof. Dr.-Ing. André Kaup	ST
M 3.9	Wavelet-Transformationen in der Bildverarbeitung / Wavelet Transformations in Image Processing Exercise (Theoretical or Practical)	WTBV	3+1+0+0	7,5	0	0	7,5	0	30	m	INF	apl. Prof. i. R. Volker Strehl	WT

M 4 Enhanced Medical Engineering Competences				L+E+S+P	10	5	0	5	0	PfE			
M 4.1	Innovation Technology			2+2+0+0	5	5	0	0	0	gCA	WISO	Prof. Dr. Kathrin M. Möslein	WT
M 4.2	Interdisciplinary Innovations in Medical Engineering	ININMEN		0+0+2+0	2,5	2,5	0	0	0	uCA	ZiMT	Sultan Haider, Dipl.-Ing. Tobias Zobel, Dr.-Ing. Kurt Höller, MBA	WT/ST
M 4.3 ⁴	Seminar Medical Engineering and Ethics, consisting of:				5			5					
M 4.3 a	Ethics in Medicine	MEDET		0+0+2+0	2,5		0	2,5	0	uCA	ZiMT	Dr. Jens Ried, Dr.-Ing. Kurt Höller, MBA	WT/ST
Seminar (1 out of 4):				0+0+2+0	2,5		0	2,5	0	gCA	ZiMT	see seminar catalog	
M 4.3 b	Green Hospital	Green Hospital										Dr.-Ing. Kurt Höller, MBA, Dipl.-Ing. Tobias Zobel	WT/ST
M 4.3 b	Medical Devices of the Future	FutureMD										Dr.-Ing. Kurt Höller, MBA, Dipl.-Ing. Tobias Zobel	WT/ST
M 4.3 b	Operating Room of the Future	Future OR										Dr.-Ing. Kurt Höller, MBA, Dipl.-Ing. Tobias Zobel	WT/ST
M 4.3 b	Interventional and Diagnostical Endoscopy	InDiEndo										PD Dr. Thomas Wittenberg	WT/ST

⁴ Obligatory

M 5 Medical Engineering Consolidation Module				L+E+S+P	10	0	5	5	0	gCA			
M 5.6	Software Test and Analysis (Software Verification and Validation) Exercise	SWE-VV		2+2+0+0	5	0	0	5	0	60 w	INF	Prof. Dr. Francesca Saglietti	WT
M 5.1	Optical Technologies in Life Science GPP	OIC/OTLS		4+0+0+0	5	0	0	5	0	90 w	WW	Prof. Dr. med. habil. Dr. rer. nat. Oliver Friedrich	WT
M 5.2	Lasers in Healthcare Engineering GPP	LASHE		2+0+0+0	2,5	0	0	2,5	0	60 w	WW	Ilya Alexeev, Ph.D.	WT
M 5.4	Biomaterials for Tissue Engineering GPP	BioMTE-MT		2+0+0+0	2,5	0	2,5	0	0	60 w	WW	Prof. Dr. Aldo R. Boccaccini	ST
M 5.12	Integrated Production Systems (Lean Management) GPP Exercise	IPS		2+2+0+0	5	0	5	0	0	30 o	INF	Prof. Dr.-Ing. Jörg Franke	WT
M 5.8	eBusiness Technologies und Evolutionäre Informationssysteme	EBTEIS		4+0+0+0	5	0	0	5	0	30 o	INF	Prof. Dr. Richard Lenz, Dr.-Ing. Christoph P. Neumann, Dr.-Ing. Florian Irmert	WS
M 5.9	Human Computer Interaction Exercise	HCI		3+1+0+0	5	0	5	0	0	90 w	INF	Prof. Dr. Björn Eskofier	SS
M 5.10	Convex Optimization in Communications and Signal Processing Übung	ConvOpt		3+1+0+0	5	0	0	5	0	30 o	EEl	apl. Prof. Dr.-Ing. Wolfgang Gerstaecker	WS
M 5.11	Image Processing in Optical Nanoscopy Übung	IPNano		1+1+0+0	5	0	0	5	0	30 o	INF	PD Dr.-Ing. habil. Harald Köstler, Dr. Gerald Donnert	SS

M 6 Medical Engineering Practice Competence		L+E+S+P	10	0	0	10	0	uCA			
M 6.1	Academic Laboratory	0+0+0+4	5	0	0	5	0	uCA		Dipl.-Ing. Tobias Zobel	WT/ST
M 6.2	Research Laboratory	0+0+0+4	5	0	0	5	0	uCA		Dr.-Ing. Kurt Höller, MBA	WT/ST
M 6.1 + M 6.2	Alternative for M 6.1 and M 6.2: Flat-Panel CT Reconstruction	ProjFCR	0+0+0+8	10		10		uCA		Prof. Dr.-Ing. habil. Andreas Maier	WT/ST

M 7 Softskills			10	0	0	10	0	gCA			
M 7.1	Softskills any graded lecture/course at the university		10	0	0	10	0				

M 8 Master's Thesis			30	0	0	0	30	PfE			
M 8	Master's Thesis		30	0	0	0	30				

For M3 you can use max. 5 ECTS points from the module groups M2 to M3 of all branches of study.

For M5 you can use max. 5 ECTS points from the module groups M2, M3 or M5 of all branches of study.

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

L Lecture

E Exercise

S Seminar

P Practical Exercise

WT Winter Term

ST Summer Term

PfE Portfolio Examination
(Combination of graded and ungraded Course Achievement or Exam consisting of several parts.)

gCA graded Course Achievement

uCA ungraded Course Achievement

w written

o oral

online online (Virtual College Bavaria)

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