

Courses of the Master's program "Biomedical Engineering"

Course Title	Instructors	Faculty	ECTS	
Basic Modules (30 ECTS)	Basics in Human Medicine (mandatory for students with non-medical background)			15
	Medical Terminology	H.-F. Zeilhofer, J. Beinemann	DBE	1
	Anatomy	N. Friederich	DBE	6
	Physiology	Dieter Kunz	DBE	6
	Biology of Tissue Regeneration	I. Martin, A. Scherberich, A. Barbero	DBM/DBE	2
	Mathematics (mandatory for students with medical/life science background)			15
	Mathematics for Biomedical Engineering I	E. Delgado, Georg Schulz	DBE	4
	Programming for Medical Data Analysis	P. Cattin,	DBE	3
	Mechanics in Biomedical Engineering	G. Rauter	DBE	3
	Statistical Methods I: Understanding Statistics with R	M. Simon	Nursing Science	5
	Biomedical Engineering (mandatory for all students)			15
	Materials Science and Biomaterials	B. Müller, G. Schulz, A. Zam, S. Madduri	DBE	5
	Principles of Medical Imaging	P. Cattin, N. Salameh, M. Sarracanie	DBE	3
	Clinical Biomechanics	R. Brunner, A. Mündermann	DBE	3
Data Processing and Control	P. Cattin, G. Rauter	DBE	4	

	Course Title	Instructors	Faculty	ECTS
Major Modules (at least 28 ECTS)	Biomaterials Science & Nanotechnology (B. Müller)			29
	Advanced Methods in Medical Image Analysis	P. Cattin	DBE	6
	Medical Image Analysis Lab	P. Cattin	DBE	5
	Applied Engineering in the Hospital	N. Friederich	DBE	2
	Applied methods in forensic biomedical and toxicological science	E. Scheurer,	DBE	1
	Biomedical Acoustics	C. Stieger	DBE	3
	Cells and Technologies in Regenerative Surgery	A. Scherberich	DBM/DBE	3
	Computer-Assisted Surgery	P. Cattin	DBE	3
	Digital Dentistry	K. Jäger	DBE	3
	Hands-on Magnetic Resonance Imaging	N. Salameh	DBE	5
	High-resolution X-ray imaging: Sample preparation, data acquisition, image analysis and efficient publishing	G. Schulz	DBE	3
	Introduction to Ethics			3
	Laser and Optics in Medicine	A. Zam	DBE	6
	Magnetic Resonance Imaging	O. Bieri	DBE	3
	Materials Science in Regenerative Medicine	S. Madduri	DBE	3
	Mathematics for Biomedical Engineering II	E. Delgado	DBE	4
	Optimal and robust control	G. Rauter	DBE	5
	Rapid Prototyping for Measurement Systems, Automation, Control, Artificial Intelligence, and Virtual Reality	G. Rauter	DBE	5
Regulatory Affairs and Their Applications		DBE	3	

	Course Title	Instructors	Faculty	ECTS
Major Modules (at least 28 ECTS)	Image-Guided Therapy (P. Cattin)			28
	Advanced Methods in Medical Image Analysis	P. Cattin,	DBE	6
	Medical Image Analysis Lab	P. Cattin	DBE	5
	Applied Engineering in the Hospital	N. Friederich	DBE	2
	Biomedical Acoustics	C. Stieger	DBE	3
	Computer-Assisted Surgery	P. Cattin	DBE	3
	Hands-on Magnetic Resonance Imaging	N. Salameh	DBE	5
	High-resolution X-ray imaging: Sample preparation, data acquisition, image analysis and efficient publishing	G. Schulz	DBE	3
	Introduction to Ethics			3
	Laser and Optics in Medicine	A. Zam	DBE	6
	Magnetic Resonance Imaging	O. Bieri,	DBE	3
	Optimal and robust control	G. Rauter	DBE	5
	Rapid Prototyping for Measurement Systems, Automation, Control, Artificial Intelligence, and Virtual Reality	G. Rauter	DBE	5
Regulatory Affairs and Their Applications			3	
Further Modules (32 ECTS)	Free Electives			2
	The students can acquire up to 2 ECTS from a course offered at the university or by learning contract.			
	Master Thesis			25
	Six-month Master thesis is typically on a clinically relevant challenge in one of the major supervised by an instructor of the program. Master thesis is ideally supervised by a technical expert and a medical doctor.			
Total	Master Exam			5
	Exam is usually public and takes 45 minutes. Two to four instructors judge the exam.			
				90