


## Courses of the Master's program Biomedical Engineering

Course Title	Instructors	Faculty	ECTS	
<b>Basic Modules (30 ECTS)</b>	<b>Basics in Human Medicine (mandatory for students with non-medical background)</b>			<b>15</b>
	Anatomy	N. Friederich	DBE	6
	Physiology	D. Kunz	DBE	6
	Biology of Tissue Regeneration	I. Martin, A. Scherberich	DBM/DBE	3
	<b>Mathematics (mandatory for students with medical/life science background)</b>			<b>15</b>
	Mathematics for Biomedical Engineering I	E. Delgado-Eckert	DBE	5
	Programming and Statistics for Medical Data Analysis	P. Cattin, P. Sinues	DBE	4
	Mechanics in Biomedical Engineering	G. Rauter	DBE	6
	<b>Biomedical Engineering (mandatory for all students)</b>			<b>15</b>
	Materials Science and Biomaterials	B. Müller,	DBE	5
	Principles of Medical Imaging	P. Cattin, N. Salameh	DBE	3
	Clinical Biomechanics	R. Brunner, A. Mündermann	DBE	3
	Data Processing and Control	P. Cattin, G. Rauter	DBE	4

Each student attends the courses of the Biomedical Engineering Module and the courses of one of the other 2 Modules (Mathematics OR Basics in Human Medicine)

	Course Title	Instructors	Faculty	ECTS
<b>Major Modules (at least 28 ECTS)</b>	<b>Biomaterials Science &amp; Nanotechnology (B. Müller)</b>			<b>28</b>
	Biomedical Acoustics	C. Stieger	DBE	3
	Cells and Technologies in Regenerative Surgery	A. Scherberich	DBM/DBE	3
	Digital Dentistry	B. Müller	DBE	3
	Magnetic Resonance Imaging	O. Bieri	DBE	3
	Materials in Medicine: Tissue Regeneration	S. Madduri	DBE	8
	Materials in Medicine: Nanostructure Analysis	A. Sadeghpour	DBE	
	Applied Engineering in the Hospital	N. Friederich	DBE	2
	Applied methods in forensic biomedical and toxicological science	E. Scheurer	DBE	1
	Hands-on Magnetic Resonance Imaging	N. Salameh	DBE	5
	Laser and Optics in Medicine	A. Zam	DBE	6
	Regulatory Affairs and its Applications	P. Cattin	DBE	2
Einführung in die angewandte Nano-Wissenschaftsethik	R. Andorno	Nano	3	
<b>Further Modules (32 ECTS)</b>	<b>Free Electives</b>			<b>2</b>
	The students can acquire up to 2 ECTS from a course offered at the university or by learning contract.			
	<b>Master Thesis</b>			<b>25</b>
	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.			
<b>Total</b>	<b>Master Exam</b>			<b>5</b>
	Exam is usually public and takes 45 minutes. Two to four instructors judge the exam.			
				<b>90</b>

 Each student attends 4 of these 5 mandatory courses

 Each student attends 1 of these 2 mandatory courses

	Course Title	Instructors	Faculty	ECTS
<b>Major Modules (at least 28 ECTS)</b>	<b>Image-Guided Therapy (P. Cattin)</b>			<b>28</b>
	Advanced Methods in Medical Image Analysis	P. Cattin	DBE	6
	Applied Control	G. Rauter	DBE	5
	Computer-Assisted Surgery	P. Cattin	DBE	3
	Laser and Optics in Medicine	A. Zam	DBE	6
	Magnetic Resonance Imaging	O. Bieri	DBE	3
	Applied Engineering in the Hospital	N. Friederich	DBE	2
	Biomedical Acoustics	C. Stieger	DBE	3
	Hands-on Magnetic Resonance Imaging	N. Salameh	DBE	5
	Medical Image Analysis Lab	P. Cattin	DBE	5
	Rapid Prototyping for Measurement Systems, Automation, Control, Artificial Intelligence, and Virtual Reality	G. Rauter	DBE	2
	Regulatory Affairs and its Applications	P. Cattin	DBE	2
Einführung in die angewandte Nano-Wissenschaftsethik	R. Andorno	Nano	3	
<b>Further Modules (32 ECTS)</b>	<b>Free Electives</b>			<b>2</b>
	The students can acquire up to 2 ECTS from a course offered at the university or by learning contract.			
	<b>Master Thesis</b>			<b>25</b>
	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.			
<b>Total</b>	<b>Master Exam</b>			<b>5</b>
	Exam is usually public and takes 45 minutes. Two to four instructors judge the exam.			
				<b>90</b>

Each student attends 4 of these 5 mandatory courses; each student attends 1 of these 2 mandatory courses