

# Module Medical Technology

Module Name: Medical Technology

Module Number	Level	Master	Short Name	MT
Responsible Lecturers	Prof. Dr.-Ing. Stefan Müller			
Department, Facility	THL, Applied Natural Sciences			
Course of Studies	Biomedical Engineering, Master			
Compulsory/elective	Compulsory	ECTS Credit Points	8	
Semester of Studies	1	Semester Hours per Week	6	
Length (semesters)	1	Workload (hours)	200	
Frequency	WiSe	Presence Hours	80	
Teaching Language	English	Self-Study Hours	120	
Consideration of Gender and Diversity Issues	<input checked="" type="checkbox"/> Use of gender-neutral language (THL standard) <input type="checkbox"/> Target group specific adjustment of didactic methods <input type="checkbox"/> Making subject diversity visible (female researchers, cultures etc.)			
Applicability	Biomedical Engineering			
Remarks	None			

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## Module Course Medical Technology

### Course 1: Medical Technology Lecture

Course Number		Short Name	MT
Course Type	Lecture	Form of Learning	Presence
Mandatory Attendance	<input type="checkbox"/>	ECTS Credit Points	6
Participation Limit	None	Semester Hours per Week	4
Group Size (practical training, exercises, ...)	None	Workload (hours)	150
Teaching Language	English	Presence Hours	60
Study Achievements („Studienleistung“, SL)	None	Self-Study Hours	90
SL Length (minutes)	n. a.	SL Grading System	n. a.
Exam Type	Written Exam	Exam Language	English
Exam Length (minutes)	90	Exam Grading System	One-third Grades
Learning Outcomes	The students shall acquire basic knowledge in medicine, learn to communicate with physicians adequately and learn about the application of modern medical products. They shall get consolidated knowledge of current medical products used for diagnosis and therapy.		
Participation Prerequisites	Basic knowledge in physics, mathematics and engineering sciences		
Contents	<ul style="list-style-type: none"> <li>• Medical Terminology, major organ systems, generation of bioelectrical potentials, a generalized medical instrument, system-transfer function</li> <li>• Measurement of flow, flow sensors, examples</li> <li>• Measurements of the respiratory system, physiology, instruments</li> <li>• Body temperature and temperature sensors</li> <li>• Bioelectrodes and biopotential</li> <li>• ECG (Eindhoven, Goldberger, Wilson), 3D Projection</li> <li>• Bioinstrumentation amplifiers, noise, electrical field, shielding, driven right leg concept</li> <li>• Pumps: Infusion, perfusion, insulin pumps, safety concepts</li> <li>• Cardiac pacemakers and defibrillators</li> <li>• Use of models and equivalent circuits</li> <li>• Exercises for the examination</li> </ul>		
Literature	John G. Webster, „ <i>Medical Instrumentation</i> “, 3rd edition, Wiley and Sons, ISBN 978-0471153689, 1997.		
Remarks	None		

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### Course 2: Medical Technology Lab

Course Number		Short Name	MT
Course Type	Lab	Form of Learning	Presence
Mandatory Attendance	<input checked="" type="checkbox"/>	ECTS Credit Points	2
Participation Limit	25	Semester Hours per Week	2
Group Size (practical training, exercises, ...)	2	Workload (hours)	50
Teaching Language	English	Presence Hours	20
Study Achievements („Studienleistung“, SL)	Lab report	Self-Study Hours	30
SL Length (minutes)	n. a.	SL Grading System	One-third Grades
Exam Type	n. a.	Exam Language	n. a.
Exam Length (minutes)	n. a.	Exam Grading System	n. a.
Learning Outcomes	Knowing of the function and practice of the main medical devices.		
Participation Prerequisites	None		
Contents	Compulsory experiments <ul style="list-style-type: none"><li>• Lung function</li><li>• ECG</li><li>• Infusion and Perfusion</li></ul>		
Literature	Hand-out, lab descriptions		
Remarks	None		