TECHNISCHE HOCHSCHULE LÜBECK

Module: Medical Technology I - Introduction

Level	Master	**Short Name**	MTI
Responsible Lecturers	Müller, Stefan, Prof. Dr.-Ing.		
Department, Facility	Applied Natural Sciences		
Course of Studies	Regulatory Affairs, Master		
Compulsory/elective	Compulsory	**ECTS Credit Points**	5
Semester of Studies	1	**Semester Hours per Week**	4
Length (semesters)	1	**Workload (hours)**	150
Frequency	WiSe	**Presence Hours**	
Teaching Language	English	**Self-Study Hours**	150

The following section is filled only if there is **exactly one** module-concluding exam.

Exam Type	Portfolio Exam	**Exam Language**	English
Exam Length (minutes)		**Exam Grading System**	One-third Grades
Learning Outcomes	• Students can explain the key measurement principles used in medical devices and the associated sensors.• Students are familiar with the fundamental physiological and anatomical concepts and can explain the functions of the organs of the cardiovascular system.• Students can design simple circuits for measuring biosignals (particularly ECGs) based on operational amplifiers.• Students can analyze the functions of key medical devices.• Students are able to assess technical risks that may arise from the malfunction of medical devices.		
Participation Prerequisites			

The previous section is filled only if there is **exactly one** module-concluding exam.

Consideration of Gender and Diversity Issues	✔ Use of gender-neutral language (THL standard) ✔ Target group specific adjustment of didactic methods ✔ Making subject diversity visible (female researchers, cultures etc.)
Applicability	
Remarks	

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Module Course: Medical Technology I - Introduction

(of Module: Medical Technology I - Introduction)

Course Type	Online Course	**Form of Learning**	Online supported
Mandatory Attendance	no	**ECTS Credit Points**	5
Participation Limit		**Semester Hours per Week**	4
Group Size		**Workload (hours)**	150
Teaching Language	English	**Presence Hours**	0
Study Achievements ("Studienleistung", SL)		**Self-Study Hours**	150
SL Length (minutes)		**SL Grading System**	

The following section is filled only if there is a course-specific exam.

Exam Type		**Exam Language**	
Exam Length (minutes)		**Exam Grading System**	
Learning Outcomes			
Participation Prerequisites			

The previous section is filled only if there is a course-specific exam.

Contents	• Introduction (Technical Fundamentals) • Electrical Activity of Excitable Cells • The Cardiovascular System • The Electrocardiogram (ECG) • Pulmonary Function Diagnostics • Invasive Blood Pressure Measurement • Infusion and perfusion systems • Hemodialysis • Electrotherapy for cardiac arrhythmias
Literature	1. Thomas Harriehausen, Dieter Schwarzenau; Moeller: Fundamentals of Electrical Engineering; Springer Vieweg; ISBN 978-3834817853 2. Ulrich Tietze, Christoph Schenk, Eberhard Gamm; Semiconductor Circuit Design; Springer; ISBN 978-3642310256; Rainer Parthier; Measurement Technology; Springer Vieweg; ISBN 978-3658049591 3. Ute Morgenstern, Marc Kraft; Biomedical Engineering – Fascination, Introduction, Overview; De Gruyter; ISBN 978-3-11-025198-2 4. John G. Webster; Medical Instrumentation – Application and Design; John Wiley & Sons; ISBN 9780471676003 5. Jürgen Werner; Cooperative and Autonomous Systems in Medical Technology; Oldenbourg; ISBN 3-486-27559-3
Remarks	