



EIT

FAKULTÄT FÜR
ELEKTROTECHNIK UND
INFORMATIONSTECHNIK

Faculty of Electrical Engineering and Information Technology

Catalog of Elective Modules

for the Master's program

Medical Systems Engineering

February 1, 2017

Regular curriculum

Choice of two deepening. Choice of modules with a total number of 15 CP per deepening. Choice of modules with a total number of 5 CP from the entire range in addition.

Research Track

Choice of modules with a total number of 15 CP from one deepening.

Explanation to the general curriculum:

- S** = semester hours (SWS)
- A** = Types of courses
 - V** = Lecture
 - S** = Seminar
 - Ü** = Tutorial
 - K** = Colloquium
 - LP** = Lab Project
 - PRO** = Research Project
 - E** = Field trip
 - *** = Depends on the chosen modules or not applicable
- CP** = Credit Points

Explanation to the Examination schedule:

- LN** = Required course certificates (prerequisite)
 - *** = Depends on the chosen modules
- PL** = Types of course-related examination achievements
 - K** = written examination
 - M** = oral examination
 - H** = thesis
 - EA** = experimental work
 - PRO** = research project
 - R** = seminar paper
 - *** = Depends on the chosen modules
- CP** = Credit Points

Timing of the course assessment:

During the examination period of the semester in which the course attended.

Legende zum Regelstudienplan:

- S** = Semesterwochenstunden (SWS)
- A** = Art der Lehrveranstaltung
 - V** = Vorlesung
 - S** = Seminar
 - Ü** = Übung
 - K** = Kolloquium
 - LP** = Laborpraktikum
 - PRO** = Wissenschaftliches Projekt
 - E** = Exkursion
 - *** = Abhängig von der Modulwahl oder nicht zutreffend
- CP** = Credit Points = Leistungspunkte

Legende zum Prüfungsplan:

- LN** = erforderliche Leistungsnachweise (Prüfungsvorleistung)
 - *** = Abhängig von der Modulwahl
- PL** = Art der Prüfungsleistung
 - K** = Klausur
 - M** = Mündliche Prüfung
 - H** = Hausarbeit
 - EA** = Experimentelle Arbeit
 - PRO** = Wissenschaftliches Projekt
 - R** = Referat
 - *** = Abhängig von der Modulwahl
- CP** = Credit Points = Leistungspunkte

Zeitpunkt der Prüfungsleistung:

Im Prüfungszeitraum am Ende des Semesters, in dem das Modul belegt wurde.

Elective modules

Enrolment - regular curriculum: Choice of two deepening. Choice of modules with a total number of 15 CP per deepening. Choice of modules with a total number of 5 CP from the entire range in addition.

Enrolment - Research Track: Choice of modules with a total number of 15 CP from one deepening.

Elective Modules - Deepening "Imaging and Interventions"	2. Semester			3. Semester			Summe			LN	PL	
	CP	S	A	CP	S	A	CP	S	A			
Nuclear medicine				5	3	V/Ü	5	3	V/Ü		K90	
Methods of MRI	5	3	V/Ü				5	3	V/Ü	Tutorial certificate	M	
Computed Tomography	5		V/Ü	5		V/LP	10		V/Ü/LP	Tutorial certificate	K120	
<i>submodule: Medical Imaging - Computed tomography</i>		3	V/Ü					3	V/Ü			-----
<i>submodule: Computed Tomography in Material Science</i>				1		V		1	V			-----
<i>submodule: Lab course CT</i>				2		LP		2	LP	Lab certificate	-----	
Computer Aided and Image Guided Interventions	2		S	8		V/S	10		V/S	Seminar certificate	H	
<i>submodule: Computer Assisted Surgery</i>					3	V/S		3	V/S			-----
<i>submodule: Simulation in Medicine and Medical Engineering</i>				1		S		1	S			-----
<i>submodule: Medical Imaging in Interventional Endovascular Therapy</i>		1	S					1	S	Seminar certificate	-----	
	12			18			30					

Elective Modules - Deepening "Biomedical Signals"	2. Semester			3. Semester			Summe			LN	PL
	CP	S	A	CP	S	A	CP	S	A		
Digital Information Processing Lab				5	2	S	5	2	S		EA
EMC of Medical Systems				5	3	V/Ü	5	3	V/Ü		M
Tomographic Imaging in Medicine	5	3	V/Ü				5	3	V/Ü		M
Functional Safety for Medical and Technical Systems	5	3	V/Ü				5	3	V/Ü		M
	10			10			20				

Elective Modules - Deepening "Medical Microsystems"	2. Semester			3. Semester			Summe			LN	PL
	CP	S	A	CP	S	A	CP	S	A		
Development of Bio-MEMS for Medical Engineering				10	6	V/Ü/LP	10	6	V/Ü/LP		K120
MEMS-Packaging for Medical Solutions				5	3	V/Ü	5	3	V/Ü		K120
				15			15				

Elective Modules - Deepening "Biomechanics and Haemodynamics"	2. Semester			3. Semester			Summe			LN	PL
	CP	S	A	CP	S	A	CP	S	A		
Computational Biomechanics	5	3	V/Ü				5	3	V/Ü	Tutorial certificate	M
Rheology and Rheometry				5	3	V/PRO	5	3	V/PRO		M
Computational Fluid Dynamics				5	3	V/PRO	5	3	V/PRO		PRO
	5			10			15				

Elective Modules - Deepening "Medical Computer Science"	2. Semester			3. Semester			Summe			LN	PL
	CP	S	A	CP	S	A	CP	S	A		
Bayesian network	5	4	V/Ü				5	4	V/Ü	Tutorial certificate	M
Machine Learning for Medical Systems	5	4	V/S				5	4	V/S	Tutorial certificate	M
Image Coding	5	3	V/Ü				5	3	V/Ü		M
Advanced Security Issues in Medical Systems				5	3	S	5	3	S		M
Medical Visualization				5	4	V/Ü	5	4	V/Ü	Tutorial certificate	K120
Selected Topics in Image Understanding				5	3	V/Ü	5	3	V/Ü		M
	15			15			30				

Elective Modules - Deepening "Neuro-Biology"	2. Semester			3. Semester			Summe			LN	PL
	CP	S	A	CP	S	A	CP	S	A		
Theoretical Neuroscience I	5	3	V				5	3	V	Tutorial certificate	K180
Theoretical Neuroscience II				5	3	V	5	3	V	Tutorial certificate	K180
Mathematical Modeling of physiological Systems	5	3	V/Ü				5	3	V/Ü	Tutorial certificate	M
Brain Computer Interfaces				5	3	S/LP	5	3	S/LP		EA
	10			10			20				