MSc. Mikrosystemtechnik – Einführung in den Studienplan

Albert-Ludwigs-Universität Freiburg

MSc-Programm in MST

- **Grundlegende Regelungen**
  - Ca. 30 ECTS pro Semester
  - Ca. 30 Stunden Arbeitsaufwand pro ECTS-Punkt
  - Pflichtveranstaltungen werden jedes 2. Semester angeboten.
  - Prüfungen werden jedes Semester angeboten.

Prüfungssystem

- **Studienleistungen**
  - Berichte, Übungen, Protokolle, ...
  - Benotung ist nicht endnoten-relevant
  - Beliebig oft wiederholbar
- **Prüfungsleistungen**
  - Meistens Klausuren oder mündliche Prüfungen
  - Immer benotet
  - Gehen immer in die Endnote ein
  - Begrenzte Anzahl von Wiederholungsversuchen
- **Benotung**
  - Endnote berechnet sich aus dem nach ECTS-Punkten gewichteten Durchschnitt der Modulnoten

Studienplan I

Modul	Semester	Art	ECTS
Bereich Fortgeschrittene MST			**30**
Mikroelektronik	1	VÜ	5
Mikromechanik	1	VÜ	5
Mikrooptik	1	VÜ	5
Sensorik/Aktorik	1	V+Pr	5
Aufbau- und Verbindungstechnik	1	VÜ	5
Mikrofluidik	1	VÜ	5

V = Vorlesung, Ü = Übung, Pr = Praktikum

Studienplan II

Modul	Semester	Art	ECTS
3 Vertiefungsrichtungen, mind. 15 ECTS in jeder, insgesamt 60 ECTS.			
Circuits and Systems	1-4		
Design and Simulation	1-4		
Life Sciences: Biomedical Engineering	1-4		
Life Sciences: Lab-on-a-chip	1-4		
Materials	1-4		
MEMS Processing	1-4		
Photonics	1-4		
Sensors and Actuators	1-4		
Personal Profile	1-4		
Masterarbeit	3-4		30
Gesamt	1-4		120

Vertiefungsmodule für MST und MSE

Die folgenden Module sind nur Beispiele. Das aktuelle Angebot finden Sie immer in HisinOne.

Circuits and systems	Design and Simulation
Energy Storage and Conversion using Fuel Cells	Embedded Control Laboratory
Mixed Signal CMOS Circuit Design	Flight Control Laboratory
Advanced embedded Systems Laboratory	Modelling and System Identification
Advanced Laboratory in Microcontroller	Numerical Optimisation
Power Electronics: Devices and Concepts	Numerical Optimisation Software Project
Magnetic Microsystems	Numerical Optimal Control in Science and Engg.
Embedded Control Project	Optimal Control and Estimation
Microcontroller Techniques	Optimal and Model Predictive Control
Power Electronic Circuits and Devices	Race Car Control Lab
RF- and Microwave Devices and Circuits	VLSI System Design
RF- and Microwave Systems Design course	Wind Energy Systems
Systems Theory and automatic Control II	
Reliability Engineering	

Vertiefungsmodule für MST und MSE

Life Sciences: Biomedical Engg.	Life Sciences: Lab-on-a-chip
Analyse von Life Science Hochdurchsatzdaten mit Galaxy	Bioactive Polymer Surfaces
Selected Problems in Biosignal Processing	Biofuel Cells and Bioelectrochemical Systems
Biofunctional Materials - for medical microsystems and healthcare	BioMEMS
Biologie für Ingenieure	Biotechnology for Engineers I: Introduction, Molecular- and Microbiology
Bionic Sensors - Laboratory	Biotechnology for Engineers II
Biomedical Instrumentation I	Interfaces for Bioanalytical Systems
Biomedical Instrumentation II	Introduction to data driven life sciences
Biomedical Instrumentation - Laboratory	Basics in Molecular Biology for Bioanalytical Systems
Biophysics of the cell	Microfluidics II: Miniaturize, automate and parallelize biochemical analysis
Ethical Aspects of Neurotechnology	Surface Analysis
Fundamentals of electrical stimulation	
Introduction to physiological Control Systems	
Implant Manufacturing Technologies	
Signal processing and analysis in brain signals	
Microsystems technology in Medicine	
Nanobiotechnology	
Neurophysiology - Laboratory	
Neuroprosthetics	
Neuroscience for Engineers	

Vertiefungsmodule für MST und MSE

Materials	MEMS Processing
Bioactive Polymer Surfaces	Lithography
Bioactive Polymer Surfaces with seminar	Electrochemical production technologies
Bioinspired functional materials	CMOS-Integrated Microsystems
Computational physics: materials science	Advanced Assembly and Packaging Technology
Electrochemical Energy Applications: Batteries	Lithography
Semiconductor Technology and Devices	Advanced Silicon Technology
Ceramic Materials for microsystems	Micro-Acoustical Transducers
Ceramic technology in microsystems	Microstructured Polymer Components
Physics of Failure	Mold Flow Simulation for Replication Processes
Contact, Adhesion, Friction	Nanotechnology
Continuum Mechanics I with exercises	Advanced Engineering
Continuum Mechanics II with exercises	Surface Analysis Laboratory
Mechanical Properties and Degradation Mechanisms	Silicon-based Neural Technology
Molecular Statics and Dynamics	Surface coating Techniques
Nanomaterials	
Nano - Laboratory	
Particle Methods in Engineering	
Surface Analysis	
Polymer Chemistry for Engineers	
Polymers in Membrane Technology	
From Microsystems to the Nanoworld	
Dynamics of Materials	

Vertiefungsmodule für MST und MSE

Photonics	Sensors and Actuators
Advanced Topics in Micro-Optics	Thin Film Analyses and Nanoscale Measurement Technologies
Lasers	Bionic Sensors
Basic Optics Lab	Wireless Sensor Networks
Basic and Advanced Optics Lab	Wireless Sensor Systems
Optical Materials	Disposable sensors
Optical Properties of Micro and Nano Structures	Electrochemical energy applications: Li-ion batteries and fuel cells
Optical Trapping and Particle Tracking	Energy harvesting
Optical MEMS	Gas Sensors
Optical Measurement Techniques	Power Electronics for E-Mobility
Optical Micro-Sensors	Electrochemical Methods for Engineers
Optoelectronics	Mikroaktorik für Mikrosystemtechniker
Photonic Microscopy	Microacoustics
Photovoltaic Energy Conversion for engineers	Piezoelectric and dieelectric transducers
Photovoltaic Energy Conversion for engineers II	Quantum mechanics for engineers
Spektroskopische Methoden	Electronics Signal Processing for Sensors and Actuators
Wave Optics	Thermoelektrik
	Compound semiconductor devices