Modulbezeichnung: **Medizinelektronik (MEL)** **5 ECTS**
(Medical Electronics)

Modulverantwortliche/r: Georg Fischer
Lehrende: Georg Fischer

Startsemester: SS 2020	Dauer: 1 Semester	Turnus: jährlich (SS)
Präsenzzeit: 60 Std.	Eigenstudium: 90 Std.	Sprache: Englisch

Lehrveranstaltungen:

Medizinelektronik - Medical Electronics (SS 2020, Vorlesung, 2 SWS, Georg Fischer)
Medizinelektronik - Übung / Medical Electronics Exercises (SS 2020, Übung, 2 SWS, Hossein Fazeli Khalili)

Empfohlene Voraussetzungen:

We recommend completion of modules in “circuit design" before.

Es wird empfohlen, folgende Module zu absolvieren, bevor dieses Modul belegt wird:

Schaltungstechnik

Inhalt:

The Lecture and exercise deals with the following topics:

- Implications of MPG (Medizinproduktegesetz) on circuit design
- Electronics for medical diagnostics and therapy
- Circuit design of standard medical equipment ECG, EEG, EMG, SpO2
- Circuit technology for vital sensors
- Circuit technology for impedance spectroscopy
- Circuit technology for impedance tomography
- Circuit technology for microwave/mm-wave spectroscopic sensors
- Electronic Systems for AAL (Ambient Assisted Living)
- Electronic Systems including MEMS (Micro ElectroMechanical Systems) components
- Circuit technology around MEMS “Lab-on-chip"
- Circuit technology for implants
- Electronic circuits around „Smart Textiles“
- Body near energy harvesting

Lernziele und Kompetenzen:

- Substantial knowledge on principles for the circuit design of medical electronic devices
- Ability to analyze circuit diagrams of medical electronic devices
- Ability to separate medical electronic devices into its subfunctions
- Ability to analyze energy budget of medical sensors and circuits with body near electronics
- Basic ability to design electronic circuits to comply with obligations by MPG
- Substantial knowledge on circuit design for standard medical devices, e.g. ECG, EEG, EMG
- Substantial knowledge on wireless Body Area Networks (BAN)
- Substantial knowledge on circuit design rules for micro/mmwave medical sensors
- Substantial knowledge on circuits including microsystem (MEMS) components for health assistance systems

Studien-/Prüfungsleistungen:

Medizinelektronik (Prüfungsnummer: 60301)
(englische Bezeichnung: Medical Electronics)
Prüfungsleistung, Klausur, Dauer (in Minuten): 60
Anteil an der Berechnung der Modulnote: 100% Prüfungssprache: Englisch

Erstablegung: SS 2020, 1. Wdh.: WS 2020/2021
1. Prüfer: Georg Fischer