

## Physical Sensors

### Summary

Credits (ECTS): 4 Points

Semester: 6th Semester Bachelor

Pre-requisites with regard to content:

Basic knowledge in Physics, Electrical Engineering and Mathematics

Pre-requisites according to the examination regulations:

Regarding to the examination regulations no pre-requisites are required

Competencies:

Students understand the different working principles of sensors and are able to choose a suitable sensor for a given application. They can design electronic circuits for signal conditioning and evaluate transfer functions and sensor characteristics of magnetic field sensors, resistive, capacitive and inductive sensors.

Assessment: Exam

Maximum number of participants from the International Programme: 12

### Course: Physical Sensors

Module code: EEIB610 (part of EEIB610 Focal Subjects 2)

Lecturer: Prof. Dr. Harald Sehr

Scope of weekly semester hours (SWS): 4

Semester of delivery: summer semester, start summer semester 2024

Type: Lecture

Language of instruction: English

Content:

The fundamentals of sensor technology are introduced, working principles of physical sensors are explained and methods of signal conditioning are discussed. The topics in detail are:

Sensor application fields, overview on sensor fabrication technology, sensor characteristics, transfer function, resistive temperature sensors, strain gauges, resistive force sensors, resistive pressure sensors, signal conditioning, capacitive sensors, inertial sensors, thermocouples, magnetic field sensors, induction sensors, inductance sensors, eddy current sensors, magnetisation sensors

Recommended reading:

- Fraden, Handbook of Modern Sensors, AIP Press, Springer
- Doebelin, Measurement Systems, McGraw-Hill