2. Semester

Module title: Physical Sensors

Module summary
Module code: SSTM210
Module coordinator: Prof. Dr. Harald Sehr
Credits (ECTS): 6
Semester: 2nd semester
Prerequisites with regards to content: Basic knowledge in physics and electronics
Prerequisites according to the examination regulations: none
learning outcomes and competencies: Upon successful completion, the students… • understand the different working principles of sensors and are able to choose a suitable sensor for a given application • can design electronic circuits for signal conditioning • are able to evaluate transfer functions and sensor characteristics of resistive, capacitive and inductive sensors. • are able to apply advanced software to evaluate information from laboratory measurement systems.
Assessment: Assessment is done by a written exam (120 minutes) + lab work (passed/not passed, 1 semester)

Course: Physical Sensors
Module code: SSSTM211
Lecturer: Prof. Dr. Harald Sehr
Contact hours: 4 SWS
Semester of delivery: yearly, winter semester
Type/mode: Lecture, mandatory
Language of instruction: English
Content: The fundamentals of sensor technology are given, working principles of physical sensors are explained and methods of signal conditioning are discussed. The topics in detail are: • sensor characteristics and 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 • Niebuhr, Lindner: Physikalische Messtechnik mit Sensoren, Oldenburg • Hoffmann: Taschenbuch der Messtechnik, Hanser
Comments: -

Course: Sensors Lab A
Module code: SSTM212
Lecturer: Prof. Dr. Helfried Urban
Contact hours: 2 SWS
Semester of delivery: yearly, winter semester
Type/mode: Laboratory, mandatory
Language of instruction: English
Content: Laboratory experiments set-up with modern measurement tools and computer control. Application of software tools for sensor signal evaluation.
Recommended reading: • Stonick, Virginia L / Bradly, Kevin, Labs for signals and systems using MATLAB • Doeblin, Ernest O, Measurement Systems
Comments: -