Courses in English
Course Description

Department	06 Applied Sciences and Mechatronics
Course title	**Electronics**
Hours per week (SWS)	4
Number of ECTS credits	4
Course objective	The course offers a fundamental scientific overview on electronics. Understanding the function and characteristics of semiconductor devices and basic circuits. Expansion to transistor composite circuits. Understanding the function of basic circuits of power electronics. Understanding the function and characteristics of operational amplifiers. Design and application of analogue operational amplifier circuits.
Prerequisites	Basic knowledge in electrical engineering
Recommended reading	
Teaching methods	Lectures and hands on training
Assessment methods	100% written examination: 60'
Language of instruction	English
Name of lecturer	Helmut Fischer
Email	helmut.fischer@hm.edu
Link	https://w3pe-n.hm.edu/fakultaet/personen/p/fischer_h_/prof__dr__helmut_fischer.de.html
Course content	Semiconductor devices: Semicoductors. Current transport in semiconductors. Characteristics of electronic components: Diodes, bipolar transistors, field effect transistors, IGBT. Basic circuits: Applications of diodes. Basic circuits with bipolar transistors and field effect transistors. Introduction into power electronics: Switching an ohmic load, switching an ohmic-inductive load, switching a DC motor, step-down DC/DC converter, step up DC/DC converter, the four-quadrant chopper, frequency converter. Operational amplifiers: DC and AC characteristics. Special operational amplifiers (transimpedance, OTA). Basic circuits with operational amplifiers, negative feedback principle, frequency response, gain bandwidth product, characteristics, stability.
Remarks	