

<b>Department</b>	06 Applied Sciences and Mechatronics
<b>Course title</b>	<b>Electronics</b>
<b>Hours per week (SWS)</b>	4
<b>Number of ECTS credits</b>	4
<b>Course objective</b>	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.
<b>Prerequisites</b>	Basic knowledge in electrical engineering
<b>Recommended reading</b>	
<b>Teaching methods</b>	Lectures and hands on training
<b>Assessment methods</b>	100% written examination: 60'
<b>Language of instruction</b>	English
<b>Name of lecturer</b>	Helmut Fischer
<b>Email</b>	<a href="mailto:helmut.fischer@hm.edu">helmut.fischer@hm.edu</a>
<b>Link</b>	<a href="https://w3pe-n.hm.edu/fakultaet/personen/p/fischer_h /prof_dr_helmut_fischer.de.html">https://w3pe-n.hm.edu/fakultaet/personen/p/fischer_h /prof_dr_helmut_fischer.de.html</a>
<b>Course content</b>	Semiconductor devices: Semiconductors. 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.
<b>Remarks</b>	