Department: 06 Applied Sciences and Mechatronics

Course title: Electronics

Hours per week (SWS): 3

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:
- Lectures and hands on training

Assessment methods:
- 100% written examination: 90'

Language of instruction: English

Name of lecturer: Helmut Fischer

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Link: http://www.fb06.fh-muenchen.de/fb/index.php/de/vita.html?staffid=767

Course content:
- Semiconductor devices:
  - Band diagram and 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: