Announcement

Physical Electronics
Prof. Dr. Berndt Koslowski

Learning Outcomes
After attending the course the students will
- know the most common electronic devices, their building blocks, their properties and their applications.
- be able to construct the most common circuits and simulate them using suitable software.

Content

Lecture
- Fundamentals (block diagram, signal flow diagram, transfer functions, continuous signals, 4-poles and 4-poles theory, modulation theory, background noise)
- Components (semiconductor basics and components, phenomena of electrical contacts, fundamental circuits, alternatives to classical semiconductors)
- Circuit technology (circuit with transistors and amplifier, filters)

Laboratory course
Simulation and design of
- Fundamentals of Electrical Engineering
- Transistor circuits, analogue circuits, logical circuits
- Fundamental and advanced circuits with operational amplifiers
- Design, experimental setup, and analysis of electronic circuits
- Optional: sensors, detectors, basic devices, micro-controllers, FPGAs

Recommended Prerequisites
- Electrodynamics, Thermodynamics, Atomic Physics, Solid State Physics

Literature
There is an overwhelming crop of literature in this field; most comprehensive are
- Paul Horowitz, Winfield Hill, Thomas C. Hayes, Michael Herzogenrath, 7. Auflage 1996 und höher,
- Die hohe Schule der Elektronik I, Analogtechnik, Elektor Verlag, chapters 1-9.

Details
Lecture (3 hours per week) and laboratory (5 experiments, each 12 hours)
6 ECTS credits
Module 71507, 12107, 12117 Physical Electronics

Assessment
Oral examination (6 CP)

Lecturer
Prof. Dr. Berndt Koslowski, Institute of Solid State Physics