

# Basics of Electrical Engineering for Computer Scientists

## Registration

Participation in this lecture requires registration. Please register at the CampusOffice until 2006-11-13 at the following link: [CampusOffice](#)

## Contents

The focus of this lecture is to mediate elementary knowledge of physical principles based on functionalities of electronical computers. Furthermore, we will provide you with an insight into the most fundamental technologies and concepts that are required for designing and analysing computer-based systems (e.g. for computer integration into physical environments).

The following topics will be addressed presumably:

- Basics to Physics I: electric charge, electric field, potential, voltage, resistivity, Ohm's law, voltage divider, Kirchhoff's circuit laws
- Basics to Physics II: capacity, condensator, charging curve, RC-lowpass, inductance, RLC-circuit
- Semi-Conductor-Components I: p-n junction, diode, characteristic curve, applications: rectifier, AND/OR circuits
- Semi-Conductor-Components II: bipolar junction transistor, characteristic curve, physical explanation (nnp, pnp), applications: circuits, flip-flops
- memory technologies: RAM, ROM, EPROM, EEPROM, FLASH
- Programmable Logic: PAL, PLA, PLD, CPLD, FPGA
- Hardware Design I: Introduction to VHDL
- Hardware Design II: Synthesis of a simple control unit in VHDL
- Analogous Circuits I: Operational amplifier, basic circuits: comparator, Schmitt-Trigger
- Analogous Circuits II: Analog-Digital- and Digital-Analog-Conversion with operational amplifiers, pulse width modulated signals
- microcontrollers: architecture, programming, applications

## Literature

The structure of the lecture does not follow any specific book, however we recommend the following literature for a consolidation of lecture content:

- R. Paul: Elektrotechnik und Elektronik für Informatiker. Bd. I, Teubner, Stuttgart 1994
- G. Bosse: Grundlagen der Elektrotechnik I. BI-Hochschultaschenbücher, Mannheim 1986
- Schiffmann Schmitz: Technische Informatik (Springer Lehrbuch)
  - Band I: Grundlagen der digitalen Elektronik (4. Aufl. 2001)

- Band II: Grundlagen der Computertechnik

## Dates

- Regular Lecture Dates: Every Monday from 3:45pm-5:15pm in Roter Hörsaal (Ro).

## Exams

### 2nd Exam

- The post-review exam results are available here.

### Oral addendum exams:

- 2007-03-26:
  - 9:00am - 9:20am 268303
  - 9:20am - 9:40am 256221
  - 9:40am - 10:00am 269313
  - 11:00am - 11:20am 273695
  - 11:20am - 11:40am 274997
  - 11:40am - 12:00pm 262294
  - 12:00pm - 12:20pm 272255 (ATTENTION! Change of time)
  - 12:20pm - 12:40pm 270704 (ATTENTION! Change of time)
- 2007-03-28:
  - 5:40pm - 6:00pm 271764
  - 6:00pm - 6:20pm 275394 (ATTENTION! Change of time)
  - 6:20pm - 6:40pm 272487 (ATTENTION! Change of time)

## Contact

- Please use the forum for clarifying general questions.
- [Dr. rer. nat. Ralf Mitsching](#)
- [Dr. rer. nat. Andreas Polzer](#)
- [Dr.-Ing. Falk Salewski](#)

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