Components, (Basic) Circuits & Simulation = 'CCS'

(MScTI_ANASIM)

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- We start with some simple calculations

- Later better use Mathematica

- Then we will do circuit simulations
  - These can be done in CIP Pools
  - Or remotely via NX client X2Go (see later)

- All students need an account at the chair of circuit design
  - Will be distributed in one of next lectures

Content

- ## Basics
  - Voltage and current sources, Thévenin equivalent
  - Bode plot, transfer function, low- and high pass

- ## Devices
  - Semiconductor properties
  - Diode and transistor operation

- ## Schematic Entry & Simulation:
  - Symbols & Schematics, multiple instances, hierarchy
  - Modeling of Diode und MOS, large / small signal models
  - Analogue simulation (dc, ac, transient, sub-circuits)

- ## Circuits:
  - current mirror, gain stage, cascode, source follower, differential pair, switch
  - Differential amplifiers (maybe folded cascode)

Literature

- **Einführung in die Halbleiter Schaltungstechnik**
  H. Göbel (Author of the 'Smile' Applets), Springer, ISBN 3-540-23445-4, ~50€
  Easy to understand, nice level CD with Applets & PSPICE.

- **Analysis and Design of Analog Integrated Circuits**
  P. R. Gray, P. J. Hurst, S. H. Lewis, R. G. Meyer, 4th edition, Wiley & Sons, New York, 1993. 129.25 €
  Classic for analogue Design. Easy to read, but high level.

- **Principles of CMOS VLSI Design**
  Neil H. E. Weste, K. Eshraghian, Addison-Wesley 1994, ISBN 0-201-53376-6, 91 € (Amazon)
  Classic for CMOS Design, easy to read, not really up to date but sufficient for beginners.

- Lecture & Exercise:
- Points: 6 Credit Points
- Time: **Friday**, 9:15 – 12:30 (with 15' break)
- Location: OMZ, U012
- Teacher: Prof. Dr. P. Fischer
  INF368, 4. OG, Tel. 06221 – 54 – 16400
  peter.fischer@ziti.uni-heidelberg.de
  Visiting time: Thursdays, 11:00 (prenotation!)
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- Examination: Written examination ('Klausur')
  The exercises are important part of the exam!