

Title: Analog and Digital Electronics

(Analogna in digitalna elektronika, 1.stopnja VS, 2.letnik)

Lecturer: doc. dr. Zajec Peter

Aim of the course:

Acquiring knowledge of the passive, discrete and integrated, linear and nonlinear components. Reparcelling the knowledge on the structure and optimal choice of sensors, transducers and their adaptation to other electronic systems from the viewpoint of applications in mechatronics.

Required (pre)knowledge:

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Contents:

Acquaintance with the characteristics of real electronic components and circuits. Deepen insight into the:

- a) Review of passive and active components of electronic circuits in the field of power electronics and control technique. Linear and nonlinear resistors, capacitor. Pulse operation of passive components, the deviations of real components. Semiconductor discrete components (diodes, bipolar and unipolar transistors) in analog and digital circuits. The design and sizing of circuits and their performance evaluation.
- b) Processing of analog signals with operational amplifiers. The basic linear and nonlinear circuits with operational amplifiers. Active filters, reference sources, voltages stabilizers in the analog version.
- c) Digital logic circuits components. Basic logic gates, decoders, multiplexers, and others.
- d) Discrete sensors for transducers. Static and dynamic characteristics. Criteria for selection of sensors applied for the design of complex sensor systems. Matching circuits, discrete and integrated components.
- e) Systems integration of electronic sub-assemblies.

Selected references:

T.E. Price: Analog Electronics, Prentice Hall, London, 1997.

H. Bernstein: Sensoren und Messelektronik, München, Pflaum, 1998.