Title: Linear Electronics

Lecturer: Prof. Dr. Andrej Žemva

Aim of the course:

Gaining knowledge for analyzing and designing linear electronic circuits implemented either with discrete semiconductor devices or as integrated circuits. More advanced analog electronics, such as operational amplifier circuits and biasing techniques are also addressed.

Required (pre)knowlede:

Principles of semiconductor devices operation, Basic circuit analysis.

Contents:

Field Effect Transistors, MOSFET DC Circuit Analysis, Constant-Current Biasing, Multistage MOSFET Circuits, JFET Transistors, MOSFET Amplifier, Basic Transistor Amplifier Configurations, Single-Stage IC MOSFET Amplifiers, Basic Bipolar Transistor, DC Analysis of Bipolar Transistors, Basic Transistors Applications, Bipolar Transistor Biasing, Bipolar Linear Amplifier, Basic Transistor Amplifier Configurations, AC Load Analysis, Power Considerations, Frequency Response, Amplifier Frequency Response, System Transfer Functions, High-Frequency Response of Transistor Circuits, Ideal Operational Amplifier and Op-Amp Circuits, Integrated Circuit Biasing and Active Loads, Differential and Multistage Amplifiers, Feedback and Stability, Ideal Feedback Topologies, Loop Gain, Stability of Feedback Circuits, Frequency Compensations, Operational Amplifier Circuits, Non-ideal Effect in Operational Amplifier Circuits.

Selected reference:

Microelectronics: Circuit Analysis and Design, Donald A. Neamen, 4th edition, McGraw Hill, 2012.