

Level : bachelor		
Course title: Electronic circuits		
Status: obligatory		
ECTS: 6		
Requirements: Fundaments of electronics		
Learning objectives To teach students about the main aspects of electronic circuits, analogue and digital complex electronic circuits.		
Learning outcomes Understanding the physical principles of semiconductors, functioning of analogue and digital circuits, and application of obtained knowledge in practise.		
Syllabus		
Theory Preparation of semiconductor materials. Methods for pn junction and transistors manufacturing. Concentration of free charge carriers. Pn product. Distribution of potential and electric field in pn junction. Currents through pn junction. Breakdown in pn junction. Capacity of pn junction. Amplification properties of FET with the common source and drain. Amplification properties of BJT with common emitter, base and collector. Input and output impedance of BJT. Coefficient α at middle frequencies. BJT with common base and emitter at high frequencies. Amplifiers general, DC and selective. Oscillators. Noise and lock-in amplifier. Arithmetic logic circuits. Half adder and full adder. Addition of binary numbers. Converters parallel to serial and serial to parallel. Decoders. Memories. RAM. ROM. CCD. Digital oscilloscope.		
Practical Amplification properties of BJT with common emitter and base. Measurements of h – parameters of BJT by dynamical method. Astable multivibrator as a square wave generator. Binary counters. Decoders. A/D and D/A conversion. Digital oscilloscope. Practical realisation of one stage amplifier with BJT and it's characterisation.		
Literature 1. M. N. Horenstein, Microelectronic Circuits and Devices, Prentice Hall International Editions, New Jersey, 1996.		
Weekly teaching load	Theory: 3	Practise: 2