

Level: bachelor				
Course title: Electronic circuits				
Status: obligatory				
ECTS: 7				
Requirements: Basic electronics				
Learning objectives Expanding the knowledge obtained in the previous course. The basics of electronics. Introduction to complex analogue and digital electronic circuits.				
Learning outcomes Developed following abilities: <ul style="list-style-type: none"> - General: reading professional literature; Analysis of complex solutions and constructing the most appropriate solutions. - Specific: understanding the basic physical processes in semiconductors, functioning of complex analogue and digital electronic circuits. Application of the adopted knowledge in practice. 				
Syllabus <i>Theoretical instruction</i> 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. <i>Practical instruction</i> Amplification properties of BJT with common emitter and base. Measurements of h – parameters of BJT by dynamical method. A stable 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 its characterisation.				
Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 2	Student research:	