

Discipline	Digital Circuit Design	code: 5049	Semester – /summer/
Specialty	Electronics		
ECTS credits: 7	Form of assessment: Evaluation during semester		
Lecturer	Associate Professor, PhD Dimitar Kovachev Room: 415E Phone: +359 52 383 340 E-mail: dmkk@tu-varna.bg		
Department	Department of Electronics and Microelectronics		
Faculty	Faculty of Computer Sciences and Automation		
Learning objectives			
The curriculum course “Digital Circuits Design” introduces students to the basic topics, regarding the theoretical and practical aspects of digital circuits used in electronic devices. The discipline covers the basic logical components and series, schematics for combinational and sequential logic, programmable logic controllers, circuits for control of displays and indicators, noise and interferences in digital circuits and CAD systems for digital circuit design. The course also includes an introduction into programming languages for hardware design.			
CONTENTS:			
Training Area			Hours lectures
			Hours seminar exercises

Number systems and codes. The main Boolean algebra theorems.	4	4
Basic logic functions. Logic gates. Digital pulses.	2	2
Basic logic families – TTL, CMOS, advanced TTL and CMOS families. Characteristic.	4	6
Other logic families – ECL, BiCMOS, LVL, GaAs.	1	0
PSpice Basics. Digital Circuits Simulation.	2	4
Combinational logic circuits.	4	4
Sequential logic circuits - varieties and parameters. Counters, registers.	4	4
Pulse shapers, oscillators, mono/multivibrators and other special circuits	2	2
Display devices – Light Emitting Diode (LED), Liquid Crystal Display (LCD), Vacuum Fluorescent Display (VFD). Driving of display devices. Intelligent displays.	2	2
Programmable logical devices (PLD) – PAL, GAL, FPGA.	2	2
Digital-to-Analog and Analog-to-Digital Conversion. DAC and ADC devices.	2	0
Noise and artefacts in digital circuits. Worst-case analysis.	1	0
TOTAL: 60 h	30	30