Faculty of Electrical Engineering / APPLIED COMPUTER ENGINEERING / BASICS OF COMPUTER ENGINEERING

Course:	BASICS OF COMPUTER ENGINEERING			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
971	Mandatory	1	6	3+1+1
Programs	APPLIED COMPUTER ENGINEERING			
Prerequisites	No prerequisites required.			
Aims	Introduction to the basics of modern computer systems: basics of logical decision making, processing and storing data in a computer, basic functional units of a computer system, as well as basics of a computer design.			
Learning outcomes	After passing the exam, it is expected that the student will be able to: 1. recognizes numbers written in different systems (binary, octal, hex, BCD, decimal) and performs their conversion; 2. calculate the result of basic arithmetical operations in binary system; 3. describe in details different formats of data in binary computer (unsigned and signed integers, decimal numbers with fixed and floating point, alphanumeric characters and instructions); 4. analyze the function of basic and derived logic circuits and switching networks; 5. design basic digital systems - binary adder, multiplexer and decoder, and analyze their functioning; 6. recognize and describe memory elements according to the technology of their production, the most important characteristics and hierarchical organization of the computer system for general; 7. design high-capacity memory using memory chips with smaller capacity; 8. analyze the operation of the processor and its microprogramming control unit.			
Lecturer / Teaching assistant	Assoc. Prof. Slobodan Đukanović, Assist. Prof. Milutin Radonjić – teachers Nikola Bulatović, M.Sc. – assistant Dipl. Ing. Željko Vujović - assistant			
Methodology	Lectures, exercises and laboratory exercises, individual work on practical tasks, consultations.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introductory lesson. Computer organization. History and development of computer engineering.			
I week exercises				
II week lectures	Numeral systems: binary, octal, hexadecimal. Binary arithmetic.			
II week exercises	Numeral systems: binary, octal, hexadecimal. Binary arithmetic.			
III week lectures	Data format. BCD code. BCD code arithmetic. Boolean algebra. Binary logical elements.			
III week exercises	BCD code arithmetics. Boolean algebra.			
IV week lectures	Clocking. Latch.			
IV week exercises	Clocking. Latch.			
V week lectures	Logic function. Logic circuit diagram.			
V week exercises	Logic function. Logic circuit diagram.			
VI week lectures	First test.			
VI week exercises	First test.			
VII week lectures	Basic digital systems: decoder, coder.			
VII week exercises	Basic digital systems: decoder, coder.			
VIII week lectures	Basic digital systems: multiplexer, demultiplexer.			
VIII week exercises	Basic digital systems: multiplexer, demultiplexer.			
IX week lectures	Computer memories. Instruction and data storing in a computer system. RAM and ROM.			
IX week exercises	Computer memories.			
X week lectures	High capacity memories. Memory hierarchy.			
X week exercises	High capacity memories.			
XI week lectures	Central processing unit - CPU.			
XI week exercises	Central processing unit - CPU.			
XII week lectures	Second test.			

XII week exercises	Second test.
XIII week lectures	CPU control. Microprogram examples.
XIII week exercises	CPU control. Microprogram examples.
XIV week lectures	One simple computer.
XIV week exercises	One simple computer.
XV week lectures	Final exam.
XV week exercises	Final exam.
Student workload	3 hours for teaching, 1 hour for exercises, 1 hour for laboratory exercises, 3 hours and 40 minutes for individual work, including consultations.

Per week	**Per semester**
6 credits x 40/30=8 hours and 0 minuts 3 sat(a) theoretical classes 1 sat(a) practical classes 1 excercises **3 hour(s) i 0 minuts** of independent work, including consultations	Classes and final exam: **8 hour(s) i 0 minuts x 16 =128 hour(s) i 0 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **8 hour(s) i 0 minuts x 2 =16 hour(s) i 0 minuts** Total workload for the subject: **6 x 30=180 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **36 hour(s) i 0 minuts** Workload structure: **128 hour(s) i 0 minuts (cources), 16 hour(s) i 0 minuts (preparation), 36 hour(s) i 0 minuts (additional work)**
Student obligations	Lessons attendance is mandatory for students, as well as doing home and laboratory exercises and both tests.
Consultations	After lessons.
Literature	Lj. Stanković, V.N. Ivanović, M. Radonjić, Osnovi računarstva, Podgorica 2014; M. Radonjić, handouts with solved examples.
Examination methods	- Home exercises carry 5x1 points. - Laboratory test carries 5 points. - Each test carries 20 points (40 points total). - Final exam carries 50 points. Student gets the passing grade by collecting 51 points at least.
Special remarks	
Comment	

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points