

Program	Level		Schort cycle				
	Name of the program		Infomation Technologies				
COURSE							
Course title	Computer Systems						
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)			
IT 130	I	Mandatory course	6	3+3+0			
Lecturer							
Course Goals	The course aims to acquaint students with the basic terms and concepts of computer science and to introduce the basic concepts of digital technology that are necessary for understanding the operation of a computer as a programmable digital machine. In addition, students will be introduced to the structure of computer systems, the basic concepts of computer communications, the principles of algorithmic thinking, the methodology of solving problems using computers, and the basic concepts of advanced programming languages.						
Learning Outcomes	By the end of the course, the students will understand the work of all components of the computer system, the basic principles of computer operation as an information processing tool, the basic principles of digital data processing, the organization of data in the computer memory, the connection between logical algebra and digital techniques, advanced methods of Boolean algebra for the analysis and synthesis of more superficial digital structures, the relationship between hardware and software, the basic concepts related to high-level programming languages.						
COURSE CONTENT							
<ul style="list-style-type: none"> - Hardware structure of modern computers. Organization of data in the computer memory. The basic concepts of BooleanAlgebra. Bits, data types, and operations. - The transformation and minimization of Boolean functions using Karnaugh maps. Logical gates. Combinatorial logical circuits. The synthesis of combinatorial circuits. - Coder. Decoder. Multiplexer (MUX). Demultiplexer (DMUX). The applications of muxes and demuxes. Synthesis with muxes and demuxes. Half Adder. Full Adder. The Programmable Logic Array(PLA).Logical Completeness.The equations for the finite automata and sequential networks. - Basic storage elements. R-S Letch. D letch. The sequential logic circuits. Elementary automata (flip-flops).Memory organization. The Addressability of memory. Registers. Counters. - The processing unit is a sequential circuit. Machine instructions and machine language. Machine programming. Assembly Language. Assembly programming. - The processor types and addressing modes. Input-output connectors and external memory. - Operating system and system software. The concept of the algorithm. Higher programming languages and their classification. - Introduction to programming in C. Variables and operators. Control structures. Functions. Testing and Debugging. Pointers and arrays. Recursion. Input-Output in C. 							
LITERATURE							
<p>[1] Ž. Jurić: Logički principi funkcioniranja računarskih sistema”, (2014), PMF Sarajevo.</p> <p>[2] Željko Jurić, Novica Nosović: Logičke osnove digitalnih i računarskih sistema, (2012), Sarajevo.</p> <p>[3] N. Nosović: “Osnove digitalnih računara”, ETF Sarajevo, 2003.</p> <p>[4] Y.N.Pat, S.J. Patel: Introduction to computing systems: From bits and gates to C and beyond, 2nd edition, (2003), McGraw-Hill.</p> <p>[5] Randy H. Katz, Gaetano Borriello:Contemporary Logic Design, 2nd edition, (2004), Prentice Hall.</p>							
STUDENT WORKLOAD (hours in a semester)							
Lectures	45	Exercises	45	Individual work	60	T o t a l	150
GRADING			REMARKS				
Criterion	Maximum points	Minimum points					
Midterm exams	45	25					
Assigments	10	5					
Final exam	45	25					
T o t a l	100	55					