Course Unit Descriptor

Study Programme: Computing And Control Engineering

Course Unit Title: Logic Design of Computer Systems

Course Unit Code: EK315

Name of Lecturer(s): Kaštelan Ivan

Type and Level of Studies: bachelor

Course Status (compulsory/elective): elective

Semester (winter/ summer): summer

Language of instruction: english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 8

Prerequisites: none

Course Aims:.

Students learn fundamentals of digital computer system design and description in a hardware description language, while being trained for digital design, verification and programming of computer systems.

Learning Outcomes:
After taking this subject students should be able to: design digital systems made of combinational circuits, sequential circuits and finite state machines, design computation structures, processors and their control units, describe the computer system in a hardware description language, program the computer system in the assembly language, translate the program written in a high-level programming language into the assembly and binary code and design the memory and input-output subsystem of the computer system at the basic level.

Syllabus.
Number representation in computer systems. Digital abstraction. CMOS implementation of logic circuits. Standard combinational and sequential circuits. VHDL description of digital systems. Timing characteristics of digital systems. VHDL description of the finite state machines. Minimization of finite state machines. Pipeline in digital systems. Computation structures. Design of control units. Design of the instruction set and implementation of the central processing unit. Assembly language: basic operations, support for branches, loops and procedures. Fundamentals of the design of assemblers and compilers. Memory hierarchy: cache memory, virtual memory. Peripheral units, interrupts and exceptions. Implementation of the central processing unit with pipeline. Pipeline hazards: data hazards, control hazards

Required Reading:
Relevant literature in English, tbd

Weekly Contact Hours: 2	**Lectures: 4**	**Practical work: 0**

Teaching Methods:
Lectures. Computer laboratory exercises. Tutorials for tests and exams. Office hours. Optional laboratory activities and projects.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			