

Course title:	Computer architecture
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Course code	Course status	Semester	Number of ECTS credits	Lecture hours
132005227	Mandatory	V	6	3+1+0

Study program:

Basic applied studies, ELECTRICAL ENGINEERING, study program: Computer engineering (studies last for 6 semesters, 180 ECTS credits).

Prerequisites:

Passed final exams in courses **Computer hardware** and **Basics of computer engineering** advisable.

Course aims:

Introduction to an organization and a modern computer system design by means of MIPS computer system design. By designing an instruction set which enables complete computer system functioning, student gains necessary knowledge in this area.

Teacher(s) and assistant(s) first and last names:

Ph.D. Veselin Ivanović – teacher
 Mr Slobodan Đukanović – assistant
 M.Sc. Srđa Jovanovski – assistant

Studying method:

Lectures, exercises, individual work on practical tasks, consultations.

Course synopsis:

Preliminary weeks	Preparation and semester enrolment.
I week	Introductory lesson. History of computer development.
II week	Computer system design methodology. Sequential circuit design.
III week	Moore and Mealy machine.
IV week	Fixed-point and floating-point arithmetics. IEEE 754 standard.
V week	First test
VI week	Instructions – the language of the computer system. Operations and operands of the computer hardware.
VII week	Free week
VIII week	Instruction types: R-type, memory-reference instructions, (un)conditional branching instructions.
IX week	Procedures and their realization in the computer hardware.
X week	Assembler programming. MIPS R2000 programming language.
XI week	Design of ALU used for introduced MIPS R2000 language instruction set implementation.
XII week	Second test
XIII week	Datapath and control unit. Design methodology. Simple (single clock cycle) implementation.
XIV week	Control unit, ALU control and CPU design.
XV week	Multiple clock cycle CPU implementation. Instruction execution dividing into separate cycles.
XVI week	Final exam
Final week	Administrative procedures.
XVIII-XXI week	Additional lessons, correction of the final exam and administrative procedures.

STUDENT WORKLOAD

<u>per week</u>	<u>per semester</u>
Working hours: 6 credits x 40/30 = 8 hours.	Teaching and the final exam: (8 hours) x 16 = 128 hours.
Working hours structure:	Necessary preparation (before semester): 2 x (8 hours) = 16 hours.
3 hours for teaching	Total work hours for the course: 6 x 30 hours = 180 hours
1 hours for exercises	Additional hours for preparing correction of the final exam, including the exam taking: up to 36 hours.
4 hours for individual work, including consultations.	Work hours structure:
	128 hours (lectures) + 16 hours (preparation) + 36 hours (additional work)

Lessons attendance is mandatory for students, as well as doing home exercises and both tests.

Literature: D.A. Paterson, J.L. Hennessy, Computer organization & Design, The hardware/Software interface, Morgan Kaufmann Publishers, San Mateo, California, 1994.
 Teacher's handouts

The forms of knowledge testing and grading:

- Home exercises carry 5x1 points.
- Attendance and activity during course carry 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 for the course: The teaching is organized for student groups with approximately 120 students. If needed, the course can be also taught in English.

Teacher(s) who provided the information: Ph.D. Veselin Ivanović

Remark: