

SYLLABUS

SUBJECT COMPUTER SYSTEM ARCHITECTURE

TEACHER BOHDAN E. RYTSAR, DOCTOR SC., PROFESSOR OF RZESZOW UNIVERSITY

COURSE DESCRIPTION

The purpose of this course is to provide the fundamentals (principles, elements, components and etc.) of structure and organization (architecture) computer systems, and introduced the assembly language instructions and writing simple program structures.

Lecture:

Introduction to the computer organization (short history of computer evolution, generation of computer technology, von Neumann computer architecture); Memory organization and architecture (classification, hierarchy, parameters, types, addressing, cache memory, stack memory, ROM, RAM, (S)DRAM etc.); Input/Output organization (functions, bus and interrupt types, DMA, CD-ROM, DVD, RAID and etc., A/D and D/A Converters); Arithmetic and Logic Unit; Arithmetic/Logic Unit operations (IEEE standard); Control Unit (types and organization); Processor and Instruction Set Architectures (principles, operand (data) types and formats); RISC versus CISC; machine language and program assembly (examples of machine language codes); Advanced Architectures (types, examples).

Classes: Training of skills and practical exercises of writing simple program structures on assembly language instructions, disassembly and assembly of PC.

LEARNING OUTCOMES

A student should receive a basic knowledge about fundamentals of computer system organization and architecture, able to write simple programs on assembler.

GRADING POLICY

Lecture: Written test.

Classes: Two written tests and short questions before every classes.

TIMETABLE

Number of hours:

Lecture: 2h x 15 weeks = 30 hours (1 semester)

Classes: 3h x 15 weeks = 45 hours (1 semester)

TEXTBOOK AND REQUIRED MATERIALS

1. Noam Nisan, Shimon Schocken. The Elements a Computing Systems. Building a Modern Computer from First Principles. 2005, Massachusetts Institute of Technology
2. Linda Null, Julia Lobur. The Essentials of Computer Organization and Architecture. 2004, Helion.
3. Andrew S. Tanenbaum. Structured Computer Organization. Prentice Hall PTR, 2003.

PREREQUISITES:

High school course in discrete mathematic and digital techniques