



UNIVERSITY OF NICOSIA ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

University of Nicosia, Cyprus

Course Code COMP-335	Course Title Computer Organization and Architecture	ECTS 6
Department Computer Science	Semester Fall, Spring	Prerequisites ECE-110, COMP-111
Type of Course Required	Field Computer Science	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 3 rd	Lecturer(s) Dr Charalambos Christou
Mode of Delivery Face-to-face	Work Placement N/A	Co-requisites None

Objectives of the Course:

The main objectives of the course are to:

- Understand performance metrics
- Be introduced to an instruction set architecture
- Understand instruction types, register sets, addressing modes
- Understand flow-of-control, subroutine call and return mechanisms
- Understand the Structure of machine-level programs
- Be introduced to Arithmetic of Computers
- Construct an ALU
- Implement in hardware several Instructions like Addition, Subtraction, Multiplication and Division
- Be introduced to pipelining and memory hierarchy

Learning Outcomes:

After completion of the course students are expected to be able to:

- Apply performance metrics
- Apply the concept of an instruction set architecture, ISA, and the nature of a machine-level instruction in terms of its functionality and use of resources (registers and memory).
- Utilize the various classes of instructions: data movement, arithmetic, logical, and flow control.
- Demonstrate the way in which subroutines are called and returns made.
- Design a basic ALU
- Implement in hardware several Instructions like Addition, Subtraction, Multiplication and Division
- Explain how conditional operations are implemented at the machine level.
- Appreciate how a lack of resources in ISPs has an impact on high-level languages

- and the design of compilers.
- Know, at the assembly language level, how parameters are passed to subroutines and how local workplace is created and accessed.
 - Know pipelining and memory hierarchy

Course Contents:

- Role of Performance
- Instructions: Language of the Machine
- Arithmetic of Computers
- Constructing an Arithmetic Logic Unit
- Implementing Instructions on the ALU
- Pipelining
- Memory Hierarchy

Learning Activities and Teaching Methods:

Lectures, In-class exercises, directed reading and homework, Learning through the project and project presentations

Assessment Methods:

Homework, Quizzes, Mid-Term, Final Exam, Project

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
David A. Patterson and John L. Hennessy	Computer Organization & Design	Morgan Kaufmann	2005	

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Miles Murdocca and Vincent Heuring	Computer Architecture and Organization	Wiley	2007	