



Course Syllabus

Course Code	Course Title	ECTS Credits
ECE-322	Computer Organization	6
Prerequisites	Department	Semester
ECE-110 and COMP-111	Computer Science	Fall, Spring
Type of Course	Field	Language of Instruction
Required	Computer Engineering	English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr Charalambos Christou	3rd
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

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 Content:

- 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 / Readings:

Title	Author(s)	Publisher	Year	ISBN
Computer organization and design: the hardware /software interface	David A. Patterson and John L. Hennessy	Morgan Kaufmann	2014	ISBN: 978-0-12-407726-3

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Computer Architecture and Organization	Miles Murdocca and Vincent Heuring	Wiley	2007	ISBN-13: 9780471733881 ISBN-10: 0471733881