Fakultät für Ingenieurwesen
Facoltà di Ingegneria
Faculty of Engineering

SYLLABUS
COURSE DESCRIPTION – ACADEMIC YEAR 2024/2025

COURSE TITLE	**Computer Systems Architecture**
COURSE CODE	76240
SCIENTIFIC SECTOR	INF/01
DEGREE	Bachelor in Computer Science
SEMESTER	1st
YEAR	1st
CREDITS	6

TOTAL LECTURING HOURS	40
TOTAL LAB HOURS	20
ATTENDANCE	Attendance is not mandatory, but it is strongly recommended.
PREREQUISITES	
COURSE PAGE	https://ole.unibz.it/

SPECIFIC EDUCATIONAL OBJECTIVES	Type of course: "di base" for L-31 Scientific area: "Formazione informatica di base" for L-31 The goal of this course is to give students an understanding of: • the architecture and organization of modern computers; • the basic of the circuit logic involved in their construction; • the foundation of their programming in assembly language.

LECTURER	Nicola Gigante
SCIENTIFIC SECTOR OF THE LECTURER	INF/01
TEACHING LANGUAGE	**English**
OFFICE HOURS	Tuesday 15:00-17:00 nicola.gigante@unibz.it Faculty of Computer Science, Piazza Domenicani 3, Office POS 2.01
TEACHING ASSISTANT	Same as lecturer
OFFICE HOURS	

LIST OF TOPICS COVERED	• Computer systems organization: processors, primary memory, secondary memory, input/output and parallel architectures. • Boolean algebra and gates: Boolean algebra, gates, implementation of Boolean functions, circuit equivalence. • Digital circuits: arithmetic circuits, clocks, memory, CPU chips, buses. • Microarchitecture: design of the microarchitecture level, performance optimization. • Introduction to Instruction Set: data types, instruction formats, addressing, instruction types, flow of control. • Introduction to Assembly language
TEACHING FORMAT	This course will be delivered through a combination of formal lectures and labs.

LEARNING OUTCOMES	**Knowledge and understanding** • Understand the key principles, the structures and the organization of computer systems; • Know the fundamental principles of programming. **Applying knowledge and understanding** • Be able to develop programs to interact with microcontrollers and the operating system of modern computers. **Making judgments** • Be able to collect and interpret useful data and to judge information systems and their applicability; • Be able to work autonomously according to the own level of knowledge and understanding. **Communication skills** • Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately. **Ability to learn** • Have developed learning capabilities to pursue further studies with some degree of autonomy; • Be able to follow the fast technological evolution and to learn cutting edge IT technologies and innovative aspects of last generation information systems.

ASSESSMENT	Written exam: the assessment consists of: • theoretical questions and exercises (some exercises can be related to what was explained during the Lab) The aim of the written exam is to check the understanding of fundamental concepts and whether the candidates have also acquired detailed knowledge about computer systems architecture. This is done through open questions about both the theoretical content and the lab exercises. The score related to each part contributes to the final grade. Specifically, to pass the exam, the students must obtain 18/30.
ASSESSMENT LANGUAGE	**English**

EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS	Theoretical questions (70%) and exercises related to what has been explained during the lab (30%). The written exam questions will be evaluated in terms of correctness and clarity.

REQUIRED READINGS	• S. Tanenbaum, Todd Austin, Architettura degli elaboratori. Un approccio strutturale (sesta edizione) • Additional material will be provided during the lessons and labs.
SUPPLEMENTARY READINGS	Computer Architecture 6th Edition A Quantitative Approach by John Hennessy David Patterson for modern parallel architectures
SOFTWARE USED	*None*