Syllabus

Course Description

Course Title	Computer Systems Architecture
Course Code	76240
Course Title Additional	
Scientific-Disciplinary Sector	INFO-01/A
Language	English
Degree Course	Bachelor in Computer Science
Other Degree Courses (Loaned)	
Lecturers	Prof. Enrico Franconi, franconi@inf.unibz.it https://www.unibz.it/en/faculties/engineering/academic-staff/person/943
Teaching Assistant	
Semester	First semester
Course Year/s	1
CP	6
Teaching Hours	40
Lab Hours	20
Individual Study Hours	90
Planned Office Hours	18
Contents Summary	• Computer abstractions and technology • Bits, datatypes, and arithmetic in computer systems • Gates, circuits, and combinational logic • Sequential logic • A simple processor architecture: the CPU • Instruction sets and assembly language
Course Topics	This course belongs to the type "Attività formative di base" and the subject area is "Informatica". 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, and the foundation of their programming in assembly language.
Keywords	Computer Architecture, Digital Logic, Assembly Language, Processor Design, Data Representation
Recommended Prerequisites	There are no prerequisites for this course.
Propaedeutic Courses	
Teaching Format	The course includes frontal lectures and lab sessions.
Mandatory Attendance	Attendance is not mandatory but strongly recommended.
Specific Educational Objectives and Learning Outcomes	Knowledge and Understanding - D1.19: Understand the key principles, the structures and the organization of computer systems Applying knowledge and understanding - D2.4: Ability to develop programs to interact with microcontrollers and the operating systems of modern computers. Ability to make judgments - D3.1: Be able to collect and interpret useful data and to judge information systems and their applicability. - D3.2: Be able to work autonomously according to the own level of knowledge and understanding. Communication skills - D4.1: Be able to use one of the three languages English, Italian and German, and be able to use technical terms and communication appropriately. Learning skills - D5.1: Have developed learning capabilities to pursue further studies with a high degree of autonomy. - D5.3: Be able to follow the fast technological evolution and to learn cutting edge IT technologies and innovative aspects of last generation information systems.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	Written exam: a final written exam with exercises, and verification

	and transfer of knowledge questions; there will be no pure theoretical questions.
Evaluation Criteria	The exam questions will be evaluated based on correctness of answers, clarity of answers, ability to summarize, evaluate, and establish relationships between topics, skills in critical thinking, ability to summarize in own words.
Required Readings	• Introduction to Computing Systems: From bits & gates to C & beyond. By Yale N. Patt and Sanjay J. Patel. McGraw Hill. • Principles of Computer Hardware. By Alan Clements. Oxford University Press. • The Architecture of Computer Hardware, Systems Software, and Networking - An Information Technology Approach by Irv Englander and Wilson Won. Wiley.
Supplementary Readings	Additional material will be provided during lectures/labs.
Further Information	- Digital Trainer (digital trainer box) - https://github.com/hneemann/Digital (digital circuits simulator) - https://peterhigginson.co.uk/lmc/ (Little Man Computer simulator)
Sustainable Development Goals (SDGs)	Quality education