SYLLABUS
COURSE DESCRIPTION

COURSE TITLE	Computer Systems
COURSE CODE	76200
SCIENTIFIC SECTOR	ING-INF/05
DEGREE	Bachelor in Computer Science
SEMESTER	1st and 2nd semester
YEAR	1st
CREDITS	12
MODULAR	Yes

TOTAL LECTURING HOURS	80
TOTAL LAB HOURS	40
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; • the operating systems and their components/functionalities; • the foundation of their programming in C.

MODULE 1	Computer Systems Architecture
MODULE CODE	76200A
MODULE SCIENTIFIC SECTOR	ING-INF/05
SEMESTER	1st
CREDITS	6
LECTURER	Tammam Tillo

SCIENTIFIC SECTOR OF THE LECTURER	ING-INF/05
TEACHING LANGUAGE	English
OFFICE HOURS	It is recommended to make an appointment by email, Tammam.Tillo@unibz.it Piazza Domenicani, 3 – Office 1.17
TEACHING ASSISTANT	Tammam Tillo, Rizvi Syed Mehdi Abbas, Piazza Domenicani, 3 – Office 1.10, Syed.Rizvi@inf.unibz.it Vella Flavio
OFFICE HOURS	TBA
LIST OF TOPICS COVERED	• Computer systems organization: processors, primary memory, secondary memory, input/output. • 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. • Instruction sets: data types, instruction formats, addressing, instruction types, flow of control. • Assembly language programming.
TEACHING FORMAT	This course will be delivered through a combination of formal lectures and exercises in the lab.

MODULE 2	**Operating Systems**
MODULE CODE	76200B
MODULE SCIENTIFIC SECTOR	ING-INF/05
CREDITS	6
LECTURER	Fabio Persia Office POS 2.11, Faculty of CS, POS Building, Piazza Domenicani 3 http://www.inf.unibz.it/~fpersia/ Fabio.Persia@unibz.it
SCIENTIFIC SECTOR OF THE LECTURER	ING-INF/05
TEACHING LANGUAGE	English
OFFICE HOURS	Thursdays, 16:00 – 18:00 Office POS 2.11, Faculty of CS, POS Building, Piazza Domenicani 3 Fabio.Persia@unibz.it

TEACHING ASSISTANT	Fabio Persia and Daniela D'Auria
OFFICE HOURS	Thursdays, 16:00 – 18:00 Office POS 2.11, Faculty of CS, POS Building, Piazza Domenicani 3 Fabio.Persia@unibz.it, Daniela.DAuria@unibz.it
LIST OF TOPICS COVERED	- Programming in C - Resources - Scheduling and concurrency - Processes and synchronization - File systems and memory management - Security and protection
TEACHING FORMAT	Frontal 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 (low-level language programming and C); - have a solid knowledge of the theoretical foundations of computer science; **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 work autonomously according to the own level of knowledge and understanding - be able to judge the use of microcontrollers and operating systems and their applicability; **Ability to learn** - Have developed learning capabilities to pursue further studies with a some degree of autonomy; - be able to learn the innovative features of state-of-the-art microcontrollers and operating systems.

ASSESSMENT	Module 1 – Computer Systems Architecture: the assessment consists of two parts: - two lab reports ; - written exam. The aim of the two lab reports and the written exam are to check to which degree students have mastered the following learning outcomes: 1) Knowledge and understanding, 2) applying knowledge and understanding, 3) making judgment. Module 2 – Operating Systems: the assessment consists of: - written exam, which also includes some exercises related to what was explained during the Lab

	The aim of the written exam is to check the understanding of fundamental operating system concepts and checks whether the candidates have also acquired detailed knowledge about operating systems. This is done through open questions about both the theoretical content and the lab exercises. Both modules must be positive to pass the course. A positive evaluation of one module remains valid for all three regular exam sessions of the academic year.
ASSESSMENT LANGUAGE	English
EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS	Module 1 – Computer Systems Architecture: marks are distributed as follows: • 30% for the two lab reports (Attending the lab is not required but recommended); • 70% for the written exam. The written exam and the lab reports will be evaluated in terms of correctness and clarity. Module 2 – Operating Systems: marks are distributed as follows: • written exam: 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	Module 1 : • Students should refer primarily to their notes taken in class (lectures and exercise classes) and consult the suggested textbooks. Module 2 : • Operating System Concepts, Abraham Silberschatz et al; 2012, Ninth Edition. • C: How to Program, Seventh Edition, Paul Deitel, Harvey Deitel.
SUPPLEMENTARY READINGS	Module 1 : • S. Tanenbaum, Todd Austin, Structured Computer Organization (6th Edition) Module 2 : • Modern operating systems, Andrew S. Tanenbaum; 2008 • Operating systems: internals and design principles, William Stallings; 2001
SOFTWARE USED	Module 1 : • Mplab. Module 2 : • Dev-C++