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	During the lecture times Thursday 14:00-16:00, Faculty of computer science, Piazza Domenicani 3, Office 1.17 (it is recommended to make an appointment by email)
TEACHING ASSISTANT	Tammam Tillo, Piazza Domenicani, 3 – Office 1.17, Tammam.Tillo@unibz.it Rizvi Syed Mehdi Abbas, Piazza Domenicani, 3 – Office 1.10, SRizvi@unibz.it
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, 15:00 – 17:00 Office POS 2.11, Faculty of CS, POS Building, Piazza Domenicani 3 Fabio.Persia@unibz.it

TEACHING ASSISTANT	Fabio Persia, Piazza Domenicani, 3 – Office 2.11, Fabio.Persia@unibz.it Vincenzo Del Fatto, Piazza Domenicani, 3 – Office 2.19, Vincenzo.DelFatto@unibz.it TBA
OFFICE HOURS	TBA
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. **Applying knowledge and understanding** - be able to develop programs to interact with 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 collect useful data and to judge operating systems and their applicability; **Communication skills** - be able to use modern communication systems. **Ability to learn** - Have developed learning capabilities to pursue further studies with a high degree of autonomy; - be able to learn the innovative features of state-of-the-art operating systems; - be able to learn cutting edge IT technologies and their strengths and limitations.

ASSESSMENT	Module 1 – Computer Systems Architecture: the assessment consists of two parts: - lab exercises - written exam The aim of the assessments 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. In particular, the lab exercises are designed to improve students' ability to design solutions. The written exam consists of a set of questions and exercises. Both parts, lab exercises and the final exam are mandatory. Module 2 – Operating Systems: the assessment consists of:

	• written exam, which also includes some exercises related to what was explained during the Lab The written exam evaluates 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 in the final exam (written) about both the theoretical content and the lab exercises. All parts are compulsory and must be positive to pass. Each of the exam sessions will include both Module 1 (2 hours), and then Module 2 (2 hours) after a short break. Students have the right to sit the exam for Module 1 and/or Module 2 within the same academic year, in the three exam sessions.
ASSESSMENT LANGUAGE	English
EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS	Module 1 – Computer Systems Architecture: marks are distributed as follows: • 50% for lab exercises (Attending the lab is not required but recommended); • 50% for the written exam. The written exam 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 %). Written exam questions will be evaluated in terms of correctness and clarity. Module 1 and Module 2 must be both positive to pass the final exam. If the students pass one module the mark remains valid for the whole academic year.

REQUIRED READINGS	Operating System Concepts Abraham Silberschatz et al; 2012, Ninth Edition. C: How to Program, Seventh Edition. Paul Deitel, Harvey Deitel.
SUPPLEMENTARY READINGS	S. Tanenbaum, Todd Austin, Structured Computer Organization (6th Edition) Modern operating systems Andrew S. Tanenbaum; 2008 Operating systems: internals and design principles William Stallings; 2001
SOFTWARE USED	Dev-C++