

SYLLABUS COURSE DESCRIPTION

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

TOTAL LECTURING HOURS	40 for each module
TOTAL LAB HOURS	20 for each module
PREREQUISITES	
COURSE PAGE	https://ole.unibz.it/

SPECIFIC EDUCATIONAL OBJECTIVES	<ul style="list-style-type: none"> • Type of course: "di base" for L-31 • Scientific area: "Formazione informatica di base" for L-31 <p>The goal of this course is to give students an understanding of :</p> <ul style="list-style-type: none"> • 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.
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MODULE 1	Computer Systems Architecture
MODULE CODE	76200A
MODULE SCIENTIFIC SECTOR	ING-INF/05
SEMESTER	1st
CREDITS	6
LECTURER	Flavio Vella

SCIENTIFIC SECTOR OF THE LECTURER	ING-INF/05
TEACHING LANGUAGE	English
OFFICE HOURS	Friday 10:00-12:00 Flavio.vella@unibz.it Piazza Domenicani, 3 – Office POS 3.13
TEACHING ASSISTANT	Flavio Vella
OFFICE HOURS	
LIST OF TOPICS COVERED	<ul style="list-style-type: none"> • 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 labs.

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

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	<ul style="list-style-type: none"> • Programming in C • Scheduling and concurrency • Processes and synchronization • File systems and memory management • Storage management • Security and protection
TEACHING FORMAT	This course will be delivered through a combination of formal lectures and labs.

LEARNING OUTCOMES	<p>Knowledge and understanding</p> <ul style="list-style-type: none"> • 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; <p>Applying knowledge and understanding</p> <ul style="list-style-type: none"> • be able to develop programs to interact with microcontrollers and the operating system of modern computers. <p>Making judgments</p> <ul style="list-style-type: none"> • 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; <p>Ability to learn</p> <ul style="list-style-type: none"> • Have developed learning capabilities to pursue further studies with some degree of autonomy; • be able to learn the innovative features of state-of-the-art microcontrollers and operating systems.
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ASSESSMENT	<p>Written exam: the exam covers the topics addressed in Module 1 and Module 2 and consists of two parts:</p> <p>Part one (Module 1) – Computer Systems Architecture: the assessment consists of:</p> <ul style="list-style-type: none"> • theoretical questions and exercises (some exercises can be related to what was explained during the Lab) <p>Part two (Module 2) – Operating Systems: the assessment consists of:</p> <ul style="list-style-type: none"> • theoretical questions and exercises (some exercises can be related to what was explained during the Lab) <p>The aim of the written exam (including topics covered by module 1 and module 2) is to check the understanding of fundamental concepts and whether the candidates have also acquired detailed knowledge about computer system architecture, operating systems, and their relations. This is</p>
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	<p>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 be obtained 18/30 for each part at least.</p>
ASSESSMENT LANGUAGE	English
EVALUATION CRITERIA AND CRITERIA FOR AWARDING MARKS	<p>Part one (Module 1) – Computer Systems Architecture:</p> <ul style="list-style-type: none"> theoretical questions (70%) and exercises related to what has been explained during the lab (30 %). <p>Part two (Module 2) – Operating Systems: marks are distributed as follows:</p> <ul style="list-style-type: none"> theoretical questions (70%) and exercises related to what has been explained during the lab (30 %). <p>The written exam questions will be evaluated in terms of correctness and clarity.</p>
REQUIRED READINGS	<p>Module 1 :</p> <ul style="list-style-type: none"> S. Tanenbaum, Todd Austin, Structured Computer Organization (6th Edition) <p>Module 2 :</p> <ul style="list-style-type: none"> Operating System Concepts, Abraham Silberschatz et al; 2012, Ninth Edition. <p>Module 1 and Module 2:</p> <ul style="list-style-type: none"> C: How to Program, Seventh Edition, Paul Deitel, Harvey Deitel additional material will be provided during the lessons and labs.
SUPPLEMENTARY READINGS	<p>Module 1 :</p> <ul style="list-style-type: none"> S. Tanenbaum, Todd Austin, Structured Computer Organization (6th Edition) <p>Module 2 :</p> <ul style="list-style-type: none"> Modern operating systems, Andrew S. Tanenbaum; 2008 Operating systems: internals and design principles, William Stallings; 2001
SOFTWARE USED	<p>Module 1 :</p> <ul style="list-style-type: none"> C/C++ or Mplab. <p>Module 2 :</p> <ul style="list-style-type: none"> C/C++