



PRINCIPLES OF COMPUTER SCIENCE A

Enrollment year	2021/2022
Academic year	2021/2022
Regulations	DM270
Academic discipline	ING-INF/05 (DATA PROCESSING SYSTEMS)
Department	DEPARTMENT OF ELECTRICAL, COMPUTER AND BIOMEDICAL ENGINEERING
Course	ELECTRONIC AND COMPUTER ENGINEERING
Curriculum	PERCORSO COMUNE
Year of study	1°
Period	1st semester (27/09/2021 - 21/01/2022)
ECTS	6
Lesson hours	55 lesson hours
Language	Italian
Activity type	WRITTEN AND ORAL TEST
Teacher	DANESE GIOVANNI (titolare) - 6 ECTS
Prerequisites	Those required for the subscription to the University courses.
Learning outcomes	The objective of the course is to provide the students with logical principles of the operation and organization of computer systems and the acquisition of methods to exploit their potentials, with particular reference to the study and techniques of the computer programming. The course includes a description of the functional structure of the major hardware and software modules that compose a computer system. Moreover, the basic tools and techniques for using the computer and its programming are provided, which form the essential educational content and are the basis of the necessary experimental activity. It is believed that, once passed the exam, the student has acquired a set of cultural tools to facilitate the study of other subjects of its curriculum and, on the other hand, has identified the topics that should be independently investigated to acquire skills not provided from their study plan.

Course contents	Introductory concepts Definition of concepts, technical terms and fields of application of electronic computers. Information coding Discussion of several techniques of representation of numerical information, text, graphics inside of computers. Presentation of redundant and non-binary codes, detectors and error-correcting codes. Introduction to the Boolean algebra. Computer architecture Description of the functional structure of computers and modules that compose them. Description of the operation logic of the processors, the size of the instructions and the execution cycle, the organization of the memory devices and related access techniques, the principles of operation and characteristics of the peripheral devices. Description of the architecture of a complex computer system with reference to the problems of memory and resources management, and the parallelism of operation as well. The description provides an overview of the architecture, in terms of both hardware and software. Therefore, this topic also includes a description of the basic functionality of the software. Operating systems Presentation of the main features of operating systems, including the kernel and basic software. Classification of the various types of existing operating systems and their main features.
Teaching methods	Lectures (hours/year in lecture theatre): 30 Practical class (hours/year in lecture theatre): 25 Practicals / Workshops (hours/year in lecture theatre): 0
Reccomended or required readings	Web site: http://mclab.unipv.it/index.php/corsi?id=28 J. Glenn Brookshear, Dennis Brylow: "Informatica. Una panoramica generale", Pearson, 12^a EDIZIONE, 9/2016, Milano.
Assessment methods	Main exam The exams is a theory test. The theory test proposes 6 questions on topics covered in the lectures of Prof. Danese. There is an optional oral examination with two different purposes: • in case that the resulting overall assessment is sufficient, the oral examination allows to improve the score (but the score can also decrease); • in case theory test has been assessed as insufficient, but with a score greater or equal to 16/30, the oral test can allow to achieve, for this test, a sufficient final evaluation.
Further information	Main exam

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**Sustainable development
goals - Agenda 2030**

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