DIGITAL HERITAGE (LM85)

(Università degli Studi)

Teaching COMPUTER SCIENCE FOR CULTURAL HERITAGE

GenCod A004187

Owner professor CARLA DI BICCARI

Teaching in italian COMPUTER SCIENCE FOR CULTURAL HERITAGE

Course year 1

Teaching COMPUTER SCIENCE FOR CULTURAL HERITAGE

Language ENGLISH

SSD code ING-INF/05

Curriculum PERCORSO COMUNE

Reference course DIGITAL HERITAGE

Course type Laurea Magistrale

Location

Credits 6.0

Semester First Semester

Teaching hours Front activity hours: 30.0

Exam type Oral

For enrolled in 2025/2026

Assessment Final grade

Taught in 2025/2026

Course timetable https://easyroom.unisalento.it/Orario

BRIEF COURSE DESCRIPTION	Theoretical part_ 1. Definition of Model. Data-Information-Knowledge.Definition of informatics, algorithms, computers. Definition of computer program. The Von Neumann machine architecture: main characteristics, CPU, registers, ALU, buses, Main Memory, peripherals. Fetch-Decode-Execute cycle. The Von Neumann bottleneck. 2.Positional representation/base representation of numbers. Numbers in base 2/ binary representation of integers (positive and negative), overflow. Bit, bytes. Definition of programming language. Machine language,-low level language, high level languages. Compiled vs interpreted languages. 3.Performance measures. Computer performance as a function of the execution time. System CPU time vs User CPU time. Clock and clock cycles. 4.CPU and Cache memory. Memory hierarchy. Cache hit and miss. Single core vs multiple core architectures. CPU vs GPU. Volatile memories. RAM: SRAM, DRAM and their fundamental hardware components. Basic structure of a MOSFET. 5.Non-volatile memories. ROM, PROM, EPROM EEPROM, Flash. Floating Gate –MOSFET. 6.Solid States Drive, HDD. The OS: Basic components. Program vs process. 7.API, Virtualization concept, Virtual Machines and associated Use cases. 8.The Process Manager/Scheduler component in the OS, idle time, process context, multiprogramming, process states. 9.The os: the memory management component. Issues with continuos memory management. Python. 1.Introduction to python. Python virtual machine.Installing python. Executing python code from cmd/shell. Check installed version. Run .py from cmd/shell. Variables: declaration and assignement syntax. Variables: forbidden naming, naming best practices. 2. Fundamental data types: int, string, float, bool. Oprations with integers, operations with floats. Operations with strings. print() type() 3. Comparison operators, if conditionals. Lists and tuples. 4. For cycle, while cycle, range() method, introduction to functions, parameters and arguments. Functions vs methods. 5. Introduction to sorting algorithms.Bubble sort. 6. Introduction to object oriented programming: Classes and Objects in python Getting starrted with VS Code 7. Defining classes and objects in python. The constructor method. 8. Inheritance in object-oriented programming. Built-in libraries. 10. Project: first GUI with Tkinter, installing additional libraries with pip, using "requests" to call a simple open web service. 9. Project: installing a JobScraper application from git-hub. Creating a dataset of scraped social media posts. Pandas and dataframes, matplotlib for a simple plot.
REQUIREMENTS	None
COURSE AIMS	The course aims at teaching the foundamentals of computer science the students need to get through the other courses in the Digital Heritage Master degreee.

TEACHING METHODOLOGY	The first half of each lesson is dedicated to the explanation of theoretical concepts. The second half to the introduction to Python. All lessons can be attended in person or online (real-time streaming)
ASSESSMENT TYPE	Oral exam
REFERENCE TEXT BOOKS	Teaching materials provided on the official teams channel of the course.