UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Elements of Computer Science

2425-1-F9201P201

Aims

The first aim is to provide students with the basic understandings regarding the representation, processing, transmission and communication of digital information using a computer or a network of computers. The second aim is to teach students, thanks to theoretical lessons and practical exercises, the basic skills of computer programming in the Python field.

Contents

The teaching is made of two main parts. A first part, mainly theoretical, which deals with the fundamental concepts of: digital representation of information in computers, information systems and systems for knowledge management, computer architecture, operating systems, computer networks and internet of things.

A second part, practical-theoretical, introduces the main concepts of coding, by showing some Python examples. This part will be supported by an *ad hoc* exercise activity.

Detailed program

Digital representation of information: definition of information, digital representation of numbers, audio, images, video and characters, knowledge representation in a computer.

Information processing systems: the computer machine, types of computers, operating systems.

Computer networks and internet: computer networks basics, main types of networks, transmission media and main network devices, distributed multimedia applications.

Computer programming: definition of algorithm, programming language paradigms, programs, data types, basic data structures and programming constructs.

Examples of programming using Python and perhaps other programming languages.

Prerequisites

None

Teaching form

A part of lectures will be theoretical and will take place in a classroom; another part of the lectures will be exercise classes that will take place in a computational laboratory and/or in the classrom. For these exercise classes, students will have to use a personal computer (their own or university's ones). The exercise classes will be aimed at the development of simple script applications in the Python programming language.

We foresee the sharing the of all the didactics content needed for sudying these topics and for preparing the exam tests through eLearning tools.

Lessons will be held in presence, unless further COVID-19 related restrictions are imposed.

Textbook and teaching resource

"Informatica per le arti visive, la musica e lo spettacolo" (Massimo De Santo, Francesco Colace, Paolo Napoletano) Italy, McGraw-Hill Company, 2012.

"Laboratori di Programmazione Web" (Marco Avvenuti e Mario G.C.A. Cimino) Italy, McGraw-Hill Company, 2012.

Handouts provided by the teachers (alternative textbooks will be suggested to students not speaking Italian)

Plotting and programming in Python online free tutorial by Software Carpentry (in English)

Semester

`First semester`

Assessment method

Written exam with multiple-options questions and/or open questios to evaluate the knowledge on the course themes. The exam involves also some exercises to verify the understanding and the ability to apply the main skills

learnt.

Integrative oral exam. An oral exam might confirm or not the written exam mark.

Office hours

Through appointment (writing to davide.chicco@unimib.it)

Sustainable Development Goals

QUALITY EDUCATION