UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Computer Science and Elements of Machine Learning

2526-1-E141PV002

Learning objectives

The course in *Computer Science and Elements of Machine Learning* aims to provide students with an introduction to the main aspects of computer science, with particular focus on those most relevant to the legal field. The goal of the course is not so much to develop technical skills, but rather to offer a high-level, yet precise and detailed, overview of the main topics in computer science.

- Knowledge and Understanding
  To know and understand how computer networks work, the main types of cryptography, the structure of a blockchain, the different types of artificial intelligence, and the most relevant legal implications related to these topics.

- Applied Knowledge and Understanding
  To be able to choose the most suitable digital tool for the main legal and public administration applications, with particular attention to data and communication confidentiality. To be able to use the main models of artificial intelligence, with awareness of their potential and limitations.

- Autonomy of Judgment
  To be able to critically assess the adopted IT solutions, identifying their advantages, limitations, and regulatory implications.

- Communication Skills
  To be able to interact with IT experts in order to understand and discuss the adoption of digital tools.

- Learning Skills
  To be able to critically evaluate innovative digital tools, assessing their usefulness, weaknesses, and legal implications.

Contents

After an introduction to computer science and information representation, the course will cover a topic of great current relevance: artificial intelligence. Additionally, there will be an introduction to networks and the internet, with a focus on cybersecurity and privacy. In this context, the course will also address the Dark Web and blockchain, two topics whose understanding is essential for accurately interpreting the current reality. Finally, there will be a brief introduction to open source software and free licenses.

Detailed program

- Introduction to Computer Science
- Information Representation
- Artificial Intelligence
- Web, Security, Privacy, and the Dark Web
- Blockchain, Cryptocurrencies, and Smart Contracts
- Open Source Software and Free Licenses

Prerequisites

Ability to read simple texts in English.

Teaching methods

- 32 lectures of 2 hours each, conducted in Italian, online
- Asynchronous Practical sessions on topics covered in class

Assessment methods

The assessment will be conducted through a written exam with open-ended questions. No midterm exams are planned.
The questions will be of a general nature and will aim to assess the understanding of both the theoretical aspects related to the topics covered during the course and their practical implications. It will be essential to demonstrate an understanding of the main advantages and limitations of the technologies discussed in class, as well as the ability to select the most suitable tool to support the most common needs in the legal field.
Attention will also be given to the proper use of language and the ability to personally elaborate on the concepts.

Furthermore, the work produced during the practical sessions will be evaluated for the purpose of awarding potential bonus points on the exam score.

Textbooks and Reading Materials

Materials provided on the e-learning platform

Sustainable Development Goals