



# UNIVERSITÀ DI PISA

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## ARTIFICIAL INTELLIGENCE II

**LETIZIA MILLI**

Anno accademico  
CdS

2023/24  
BIOTECHNOLOGIES AND APPLIED  
ARTIFICIAL INTELLIGENCE FOR  
HEALTH  
785AA  
6

Codice  
CFU

Moduli	Settore/i	Tipo	Ore	Docente/i
ARTIFICIAL INTELLIGENCE II	INF/01	LEZIONI	48	LETIZIA MILLI

Obiettivi di apprendimento

### *Conoscenze*

The course aims to introduce the paradigms to neural networks and deep learning, including the basics of recurrent neural networks and models for complex data, model design and validation, and application to health problems and case studies

### *Modalità di verifica delle conoscenze*

The assessment of knowledge will be the subject of the written and project exam evaluation.

### *Capacità*

The student who completes the course successfully will be able to Identify problems facing healthcare providers that machine learning can solve and analyze how AI affects patient care safety, quality, and research.

### *Modalità di verifica delle capacità*

The student will have to solve a deep learning problem during a practical test.

### *Comportamenti*

The student will acquire a method to deal with deep learning problems and to select the most effective solution to be adopted

### *Modalità di verifica dei comportamenti*

During the lab sessions, the accuracy and precision of the activities carried out will be evaluated

### *Prerequisiti (conoscenze iniziali)*

Basic knowledge of mathematics

Knowledge of programming in python

Knowledge of the various machine learning techniques presented in the Artificial Intelligence I course

**Lo studente è invitato a verificare l'esistenza di eventuali propedeuticità consultando il Regolamento del Corso di studi relativo al proprio anno di immatricolazione. Un esame sostenuto in violazione delle regole di propedeuticità è nullo (Regolamento didattico d'Ateneo, art. 24, comma 3)" (Regolamento didattico d'Ateneo, art. 24, comma 3)**



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Programma (contenuti dell'insegnamento)

Syllabus:

- Health data
- DNN
- Embedding
- CNN
- RNN
- Autoencoder
- Attention models
- Graph neural network
- Memory network
- Deep generative model

### Bibliografia e materiale didattico

Recommended book: Introduction to Deep Learning for Healthcare, Cao Xiao Jimeng Sun

Papers on different algorithms described during the course

Slides of the lectures

Code written during the exercises

### Modalità d'esame

Written test plus individual project and oral exam

*Ultimo aggiornamento 12/02/2024 11:27*