# UNIVERSITÀ DI PISA

# ARTIFICIAL INTELLIGENCE II

## LETIZIA MILLI

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| Anno accademico | 2022/23 |
| CdS | BIOTECHNOLOGIES AND APPLIED ARTIFICIAL INTELLIGENCE FOR HEALTH |
| Codice | 785AA |
| CFU | 6 |

| Moduli | Settore/i | Tipo | Ore | Docente/i |
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| 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

### 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

## Pagina web del corso

https://polo3.elearning.unipi.it/course/view.php?id=3329

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