UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Bioinformatics and Biostatistics for Big Data and Real World Studies

2324-1002-05

Title

Bioinformatics and Biostatistics for Big Data and Real World Studies

Teacher(s)

- Daniela Besozzi
- Daniele Papetti
- Paola Rebora
- Anita Andreano
- Marco Villa
- Carlo Alberto Scirè
- Davide Bernasconi
- Isabella Castiglioni
- Elisabetta De Bernardi
- Daniele Ramazzotti
- Fabio Stella
- Marco S. Nobile
- Camilla Torlasco

Language

English

Short description

COURSE OBJECTIVES
Introduction to Machine Learning and Big Data
To cover modern methods related to artificial intelligence.

Big Data and Real World Studies – Winter School
To understand the different types of studies in epidemiological research and applications of bioinformatics on big data in medical research.

TOPICS
Introduction to Machine Learning and Big Data
Introduction to machine learning – 2h Daniela Besozzi
Unsupervised learning – 2h Daniela Besozzi
Neural networks and deep learning – 4h Daniele Papetti

Big Data and Real World Studies – Winter School
Epidemiological designs – 7h Paola Rebora
Epidemiological designs – 3h Anita Andreano
Introduction to Real World Data, Geo-spatial analysis – 4h Marco Villa
Real world study – 2h Carlo Alberto Scirè
Introduction to causal models – 4h Davide Bernasconi
Computational methods for big medical-imaging data – 2h Isabella Castiglioni
Radiomics in oncological and fibrous diseases imaging – 2h Elisabetta De Bernardi
From data to models in pandemics – 2h Daniela Besozzi
Fairies in the modern world: applications and impact of artificial intelligence in cardiac imaging – 2h Camilla Torlasto
Mutational signatures in human cancers – 2h Daniele Ramazzotti
Integrative clustering of genomic data – 2h Daniele Ramazzotti
Interpretable and explainable artificial intelligence – 2h Marco S. Nobile
Computational intelligence for biomedicine and healthcare – 2h Marco S. Nobile
Bayesian and causal networks - part I – 2h Fabio Stella
Bayesian and causal networks - part II – 2h Fabio Stella

CFU / Hours

6 / 48

Teaching period

Introduction to Machine Learning and Big Data
October 18th 17.00-19.00 Daniela Besozzi - STREAMING
October 20th 17.00-19.00 Daniela Besozzi - STREAMING
October 21st 9.00-13.00 Daniele Papetti - STREAMING

Big Data and Real World Studies – Winter School

October 23rd 9.00-12.00 Marco Villa - IN PRESENCE
October 23rd 12.00-13.00 Davide Bernasconi - IN PRESENCE
October 23rd 14.00-17.00 Davide Bernasconi - IN PRESENCE
October 23rd 17.00-18.00 Marco Villa - IN PRESENCE
October 24th 9.00-10.00 Paola Rebora - IN PRESENCE
October 24th 10.00-12.00 Carlo Alberto Scirè - IN PRESENCE
October 24th 12.00-13.00 Anita Andreano - IN PRESENCE
October 24th 14.00-15.00 Anita Andreano - IN PRESENCE
October 24th 15.00-18.00 Paola Rebora - IN PRESENCE
October 25th 9.00-13.00 Paola Rebora - IN PRESENCE
October 25th 14.00-16.00 Isabella Castiglioni - IN PRESENCE
October 25th 16.00-18.00 Elisabetta De Bernardi - IN PRESENCE
October 26th 9.00-11.00 Daniela Besozzi - IN PRESENCE
October 26th 11.00-13.00 Camilla Torlasco - IN PRESENCE
October 26th 14.00-18.00 Daniele Ramazzotti - IN PRESENCE
October 27th 9.00-13.00 Marco S. Nobile - IN PRESENCE
October 27th 14.00-18.00 Fabio Stella - IN PRESENCE

COURSE EVALUATION: November 18th 10.00-12.00

Sustainable Development Goals