

Introduction to Machine learning with Python

Lecturer: **Andrea Giussani**

Course language

English

Course description and objectives

This course provides a practical introduction to applied Machine Learning with Python.

The course focuses on the main steps of a Machine Learning project, from data preparation and model development to model evaluation and interpretation. Particular attention is given to common problems and mistakes that can affect the reliability of Machine Learning results.

At the end of the course, participants will be able to build, evaluate, and interpret a complete Machine Learning pipeline using Python.

Audience

The course is open exclusively to Bocconi students enrolled in:

- the third year of a Bachelor's program;
- any Bocconi Master's program;
- any PhD program; or
- any SDA Bocconi program

Prerequisites

The student must have a solid knowledge of **Probability** and **Statistical** Inference, and great knowledge of the **Python** language. All students are strongly encouraged to bring their own laptop.

Duration

12 hours

Teaching mode

Distance learning. The course will be delivered online through synchronous sessions. Students can join the sessions through the **Teams Classroom** section available on the course page in Blackboard.

Calendar

Lesson	Date	Time	Room
1	Tue 03/11/2026	18:15 - 19:45	Virtual room
2	Thu 05/11/2026	18:15 - 19:45	Virtual room
3	Tue 10/11/2026	18:15 - 19:45	Virtual room
4	Thu 12/11/2026	18:15 - 19:45	Virtual room
5	Tue 17/11/2026	18:15 - 19:45	Virtual room
6	Thu 19/11/2026	18:15 - 19:45	Virtual room

Syllabus of the course

Lecture	Topics	Book reference
1	Introduction to Machine Learning - Problems, Workflows and Fundamental Concepts	
2	Missing Data and Imputation in Machine Learning - Preparing data for Machine Learning applications	Ch. 1
3	Linear Models, Regularization, and Variable Selection - building reliable Machine Learning experiments	Ch. 1
4	Decision Trees and Ensemble Learning - tree-based learning, bagging, randomization, and Random Forest.	Ch. 2

5	Boosting and Gradient-Based Ensemble Methods	Ch. 2
	- principles of sequential learning, Gradient Boosting, and XGBoost.	
6	Model Explainability and Interpretation	Ch. 3
	- feature importance, local and global explanations, SHAP, and model transparency.	

Software used

Python 3.12 (or greater)

Suggested bibliography

- Giussani A., *Modern Applied Machine Learning with Python*, EGEA, 2020
- Hastie T., Tibshirani R., Friedman J., *The elements of statistical learning*, Springer, 2009

Available seats

40 – 3rd-year Undergraduate students

70 – all the other students

Please remember that you may **withdraw** from an ITEC course through the yoU@B Diary **only before** the **registration deadline**.