

# Advanced Machine Learning

*(Lina Fahed et Philippe Lenca)*

This course delves into advanced machine learning concepts, building upon the foundation laid in "Fundamentals of Machine Learning." It combines theoretical understanding with practical application, preparing students for future careers in data science. The course incorporates flipped classroom techniques and participation in online data science challenges to encourage hands-on learning and real-world problem-solving skills.

Key concepts covered:

- Pattern extraction techniques
- Explainable AI methodologies
- Few-shot learning approaches
- Advanced model optimization and tuning
- Real-world applications of advanced machine learning

By the end of this course, students will be able to:

- [BC-02] Develop explainable AI solutions and communicate their insights effectively
- [BC-03] Critically evaluate and select appropriate advanced machine learning techniques for specific problem domains
- [BC-04] Participate competitively in recognized data science challenges and competitions
- [BC-07] Implement and evaluate advanced machine learning techniques on complex, real-world problems

Prerequisites :

- Being familiar with handling several types of datasets: transactions, timeseries, images.
- Being familiar and efficient with the preparation, cleaning, merging of real-world datasets.
- Having skills in data statistical analysis including multidimensional analysis and inferential statistics.
- Being familiar and efficient with the development of unsupervised and supervised machine learning pipelines : from model building to evaluation.