



Machine Learning: Fundamentals and Algorithms

Course level: Master [M1]

Track(s): [MLDM, DSC]

ECTS Credits: 4

Course instructors: [Ievgen Redko, Amaury Habrard]

Education period: [2nd] semester **Language of instruction:** English

Expected prior-knowledge: [Data Analysis, Optimization and Operation Research]

Aim and learning outcomes: This course introduces fundamental concepts in machine learning and presents some classical approaches and algorithms. The scikit-learn library is presented during the practical sessions. The course aims at providing fundamental basics for using machine learning techniques.

Keywords: [Machine Learning, SVM, Decision Trees, Deep Learning, HMM]

Syllabus:

- Decision trees and Random Forests
- Hidden Markov Model
- Introduction to Support Vector Machines
- Neural Networks and Deep Learning
- Practical: Introduction to Scikit-learn

Organisation and timetable: [Volume CM/TD/TP] Lectures (10h), tutorials (10h) and lab sessions (10h).

Form(s) of Assessment: 1 theoretical examination (2h, 2/3), 1/3 practical assignments.

Literature and study materials:

- *An Introduction to Support Vector Machines and Other Kernel-based Learning Methods*, Nello Cristianini, John Shawe-Taylor, Cambridge University Press 2010: I-XIII, 1-189
- *Pattern Recognition and Machine Learning*, Christopher M. Bishop, Springer 2006

Additional information/Contacts:

remi.eyraud@univ-st-etienne.fr