

# Introduction to Machine Learning

**Course level: Master**

**Course code: MLDM IML**

**ECTS Credits: 4.00**

**Course instructors:** Marc Sebban (UJM, Saint- Etienne)



**Education period (Dates):** 1st semester

**Language of instruction:** English

**Expected prior-knowledge:** basic mathematics and statistics

**Aim and learning outcomes:**

This course gives a general introduction to Machine Learning, from applications to theoretical aspects in Statistical Learning Theory.

**Topics to be taught (may be modified) ~20 h**

- General Introduction to Machine Learning (learning settings, curse of dimensionality, overfitting/underfitting, etc.)
- Overview of Supervised Learning: True risk/Empirical risk, loss functions, regularization, sparsity, norms, bias/variance trade-off, statistical learning theory, generalization bounds, model selection.
- Ensemble methods (homogeneous/heterogeneous methods, theory of boosting)
- Non-parametric Methods (K-NN)

**Teaching methods:** Lectures.

**Form(s) of Assessment:** written exam (100%)

**Literature and study materials:**

Basic textbooks:

Statistical Learning Theory, V. Vapnik, 1989  
Machine Learning, Tom Mitchell, MacGraw Hill, 1997  
Pattern Recognition and Machine Learning, M. Bishop, 2013

**Additional information:**

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