Introduction to Machine Learning

Course level: Master **Course code: MLDM IML** **ECTS Credits: 3.00**

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:

Marc Sebban
University Jean Monnet, Saint- Etienne
E-mail: marc.sebban@univ-st-etienne.fr
Web page: http://labh-curien.univ-st-etienne.fr/~sebban/

Home page: *http://mldm.univ-st-etienne.fr*
e-mail: master.MLDM@univ-st-etienne.fr