

- Faculté des sciences
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Machine learning and data mining (3IN2011)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en économie appliquée	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	5
Master en finance	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	5
Master en informatique	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	5

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Automne

Equipe enseignante

- Prof. Christos Dimitrakakis
- Andreas Athanasopoulos

Contenu

- * Problems
 - Classification
 - Regression
 - Sequence prediction
- * Python
 - scikit-learn
 - matplotlib
- * Concepts and Algorithms
 - Generalisation and Model Selection
 - Loss functions and gradient descent
 - Methodology: Reproducibility, experiment design, preprocessing, pipelines
 - Probabilistic models: Maximum likelihood, Maximum a Posteriori, Bayesian inference
- * Models
 - k-Nearest Neighbours
 - Perceptron
 - Linear regression
 - Generative models
 - Multi-layer perceptrons and deep learning
 - Tree models and ensembles
- * Applications
 - Text prediction
 - Fairness
 - Privacy

Forme de l'évaluation

- In-class exercises
- Assignments/Project
- Quizzes
- Exam

Modalités de rattrapage

URLs	1) https://github.com/olethrosdc/machine-learning-neuch/tree/main/BSc 2) https://www.statlearning.com/
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All components must be passed for a pass. Individual components that are failed can be resubmitted before the Autumn semester. Failure to participate in class means you have to retake it.

Documentation

- Slides
- Course github
- Book: Introduction to Statistical Learning (Python)

Pré-requis

linear algebra, calculus, Python

Forme de l'enseignement

2 hours of lectures and 2 hours of exercises on average. Sometimes the lecture and exercise sessions are mixed into an 'active learning' module.

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Simulate a process
- Combine algorithms and models
- Design pipelines
- Explain methodology

Compétences transférables

- Explain Research
- Present Results
- Formulate Scientific question
- Analyse Problem

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