

- Faculté des sciences économiques
- [www.unine.ch/seco](http://www.unine.ch/seco)

## Machine Learning (5MI2018)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
<b>Master en développement international des affaires</b>	<b>Cours: 4 ph</b>	Voir ci-dessous	6
<b>Master en économie appliquée</b>	<b>Cours: 4 ph</b>	Voir ci-dessous	6
<b>Master en finance</b>	<b>Cours: 4 ph</b>	Voir ci-dessous	6
<b>Master in General Management</b>	<b>Cours: 4 ph</b>	Voir ci-dessous	6
<b>Master of Science en innovation</b>	<b>Cours: 4 ph</b>	Voir ci-dessous	6

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

### Période d'enseignement:

- Semestre Printemps

### Equipe enseignante

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### Contenu

The course presents a practical approach to advanced Data Mining and Machine Learning techniques. Use several Use Cases to gather first-hand experience and apply the Machine Learning techniques to real-life problems. The Use Cases have increased difficulty and are tailored towards specific goals and difficulties including the following:

- define possible problems to be solved or patterns to be discovered from the data.
- recognize the techniques to be applied to specific problems.
- evaluate and optimize the techniques.
- visualize and interpret the results.

Recognize the limitations and explore the possible places that could be improved. In this important step, advanced techniques and their advantages will be discussed and

Full Python implementations and using Python customizations/plugins to existing data mining software (RapidMiner) to enhance and adapt existing methods are used in parallel by different groups and the advantages/disadvantages of each approach is evaluated at the end of the projects.

Classic Data Mining techniques as well as new, modern, versions of the classical algorithms are explored during the course. Each project will focus on one different method from the following: Classification, Prediction, Clustering, Recommendations, Association.

### Forme de l'évaluation

- E+EI E: 2-hour written exam during the session (60%) EI: project/exercises (40%)
- Retake exam E: 2-hour written exam during the autumn session (100%)
- Online exam E+EI E: 1-hour written exam during the session (60%) EI: project/exercises (40%)
- Online retake exam E: 1-hour written exam during the autumn session (100%)
- Allowed documents during exams: course slides with annotations. Online documentation is also allowed.
- No communication with other people is permitted during the exams. In case of violation of this rule, the students are in a situation of fraud and the unauthorised items will be removed. The exam could be deemed as failed.

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## **Machine Learning (5MI2018)**

### **Documentation**

Course documentation on moodle

Introduction to Machine Learning with Python: A Guide for Data Scientists by Andreas C. Müller & Sarah Guido

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Aurélien Géron

### **Pré-requis**

The course of Data Management is strongly recommended for the data preparation as well as notions of the Python programming language

### **Forme de l'enseignement**

4h Interactive course with exercises and projects

### **Objectifs d'apprentissage**

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

- Recognise the techniques to be applied to different problems
- Demonstrate the effectiveness of a model
- Evaluate and optimise the deployment of the model
- Select transform and explore the data to bring the information to the surface
- Develop solutions to solve the problems using Machine Learning techniques
- Define possible problems to be solved or patterns to be discovered from the data
- Interpret the results of a Machine Learning techniques

### **Compétences transférables**

- Apply knowledge to new situations
- Carry out critical and evidence-based analyses