

DH-406

**Machine learning for DH**

Salzmann Mathieu

Cursus	Sem.	Type
Digital Humanities	MA1, MA3	Obl.
Digital Humanities		Opt.
Learning Sciences		Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	Written
Workload	120h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Lecture	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

This course aims to introduce the basic principles of machine learning in the context of the digital humanities. We will cover both supervised and unsupervised learning techniques, and study and implement methods to analyze diverse data types, such as images, music and social network data.

**Content**

Supervised learning:

1. Linear regression and classification
2. Kernel methods
3. Deep learning

Unsupervised learning:

1. Dimensionality reduction
2. Clustering
3. Topic models

**Keywords**

Machine learning, digital humanities, supervised and unsupervised learning

**Learning Prerequisites****Required courses**

Programming (python), Linear algebra, Probability and Statistics

**Learning Outcomes**

By the end of the course, the student must be able to:

- Choose an appropriate learning algorithm for a given problem
- Derive the mathematical formulations of basic supervised and unsupervised learning algorithms
- Develop basic supervised and unsupervised learning models
- Explain the differences between different machine learning algorithms
- Assess / Evaluate the advantages and limitations of different machine learning algorithms

**Transversal skills**

- Assess progress against the plan, and adapt the plan as appropriate.
- Continue to work through difficulties or initial failure to find optimal solutions.

### Teaching methods

Ex cathedra with exercises, computer sessions

### Expected student activities

Attend the lectures, complete the exercises, implement and test the studied methods using python

### Assessment methods

Final exam with both theoretical and practical problems

### Supervision

Office hours	No
Assistants	Yes
Forum	Yes

### Resources

#### Virtual desktop infrastructure (VDI)

No

#### Bibliography

Christopher M. Bishop, Pattern Recognition and Machine Learning  
Kevin P. Murphy, Machine Learning: A Probabilistic Perspective

#### Ressources en bibliothèque

- [Christopher M. Bishop, Pattern Recognition and Machine Learning](#)
- [Kevin P. Murphy, Machine Learning: A Probabilistic Perspective](#)

#### Moodle Link

- <https://go.epfl.ch/DH-406>