

EE-566

**Adaptation and learning**

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Cursus	Sem.	Type
Electrical Engineering		Opt.
Electrical and Electronical Engineering	MA2, MA4	Opt.
Robotics, Control and Intelligent Systems		Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
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**

In this course, students learn to design and master algorithms and core concepts related to inference and learning from data and the foundations of adaptation and learning theories with applications.

**Content**

The course covers the fundamentals of inference and learning from streaming and batch data. Students also learn about the foundations of online and batch machine learning techniques in a unified treatment. In particular, the course covers topics related to optimal inference, regularization, proximal techniques, stochastic learning, generalization theory, Bayes and naive classifiers, nearest-neighbor rules, clustering, decision trees, logistic regression, discriminant analysis, Perceptron, support vector machines, kernel methods, bagging, boosting, random forests, cross-validation, principal component analysis, and neural networks.

**Learning Prerequisites****Recommended courses**

Prior exposure to probability theory and linear algebra is recommended.

**Resources****Moodle Link**

- <https://go.epfl.ch/EE-566>