

# Syllabus

## Advanced machine learning

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	Position	Associate Professor			Major	Computer Engineering
	Group	Software and Computer Engineering				

### 1. Course Description

This course covers core machine learning algorithms and theories that have proven to be useful in recent applications. Students are expected to have some background knowledge of machine learning such as classification, regression, clustering, and neural networks. This course will be more focused on theoretical aspects of these approaches with an introduction to more advanced and recently developed techniques. The major topics include Bayesian analysis, probabilistic graphical models, and deep neural networks.

### 2. Teaching Methods

The class will be mostly based on online lectures. Lecture videos and lecture notes will be posted on Bb.

- \* Students are required to do
  - weekly assignments
  - a term project on ML related topics (a project proposal, a final report, and presentation)
- \* You will get an F grade if you miss more than 25% of the lectures.

### 3. Evaluation

The course grade will be based on exams, a term project, assignments, and class participation.

- \* Assignments: 35%
- \* Exams: 35%
- \* Project (+presentation): 30%
- \* Class participation: Pass/Fail

### 4. TextBooks

## 5. Lecture Schedule

Week	Lecture contents	Lesson type	Remark
1	Introduction	lecture	PM chap.1, DL chap..2
2	Probability and Information theory	lecture	PM 2, DL 3
3	Machine Learning Basics	lecture	PM 3,4, DL.5
4	Deep Neural Networks	lecture	DL 6
5	Regularization, Optimization	lecture	DL 7,8
6	Convolutional networks	lecture	DL 9
7	Sequence modeling	lecture	DL 10
8	Mid-term exam		
9	Graphical models	lecture	PM 8, DL 16, Project proposal
10	Mixture models and EM	lecture	PM 9
11	Approximate inference, sampling method	lecture	PM 10, DL 17, 19
12	Deep generative model	lecture	DL 20
13	Recent applications	lecture	
14	Recent applications	lecture	
15	Project presentation	lecture	Project final report
16	Final exam		

## 6. Others

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