

COGS 514 – Cognition and Machine Learning – Fall 2016-2017

Instructor: Asst. Prof. Dr. Cengiz Acartürk
Schedule: Tuesday, 08:40-11:30, Classroom S03
Contact: Informatics Institute B-203, acarturk@metu.edu.tr
Course website: <https://metuclass.metu.edu.tr/>

Course Objectives. The major goal of this course is to introduce machine learning and its applications as a research methodology at the intersection between natural and artificial cognitive systems. The course curriculum covers the fundamental topics in machine learning, including supervised learning, Bayesian decision theory, decision trees, multilayer perceptrons, and their applications in subdomains of cognitive science, including natural language processing, vision and models of human learning.

Tentative Outline

Day	Topic
October 4	Introduction to Machine Learning
October 11	Machine Learning in a nutshell
October 18	Designing a ML program
October 25	No classes* (substitute class on January 10)
November 1	Induction learning
November 8	Decision Trees
November 15	Decision Trees
November 22	Rule learning
November 29	Linear models
December 6	Midterm Exam
December 13	Issues in ML design
December 20	Perceptrons and Artificial Neural Networks
December 27	Probabilistic reasoning, Bayesian Learning
January 3	Unsupervised Learning
January 10*	Deep Learning: A premier
January 17	Final Exam

Lab Hours. The course involves hands-on training, in addition to classroom lectures. The lab hours will be held one per several weeks within the time schedule of the class hours.

Text Book. There is no specific textbook for the course. Below are some reference sources. Further sources will be announced during the lecture hours.

Alpaydin, E. (2010). *Introduction to machine learning*, Second edition. Cambridge: MIT Press.

Mitchell, T. (1997). *Machine learning*. McGraw Hill.

Russell, S. & Norvig, P. (2010). *Artificial Intelligence: A Modern Approach, Third edition*. Prentice Hall, NJ.

Witten, I. H., Frank, E., & Hall, M. A. (2011). *Data mining: Practical machine learning tools and techniques*, Third edition. Morgan Kaufman.

Grading. Midterm Exam (%40), Final Exam (%50), Attendance and Participation – both classes and labs (%10)

Notes

- Please contact me if you need disability accommodations.
- Please do not expect an immediate reply to your e-mail. It may take up to three days before a reply.

The course schedule, the course content and the grading schedule in this syllabus may be modified at any time by the course instructor. Such changes will be announced in class hours.