# CAP-5610 Introduction to Machine Learning

**Catalog Description**
Decision trees, Bayesian learning reinforcement learning as well as theoretical concepts such as inductive bias, the PAC learning, minimum description length principle. (3 credits)

**Prerequisites**
Graduate Standing

**Type**
Elective graduate courses

**Course Objectives**
A student completing this course should:
1. have knowledge and understanding of the principle algorithms used in machine learning
2. have sufficient knowledge of information theory and probability theory to provide a theoretical framework for machine learning
3. be able to apply machine learning algorithms, evaluate their performance and appreciate the practical issues involved in the study of real datasets
4. be able to provide a clear and concise description of testing and benchmarking experiments

**Topics**
- Concept Learning and the General-to-Specific Ordering
- Decision Tree Learning
- Artificial Neural Networks
- Evaluating Hypotheses
- Bayesian Learning
- Computational Learning Theory
- Instance-Based Learning
- Genetic Algorithms
- Learning Sets of Rules
- Analytical Learning
- Combining Inductive and Analytical Learning
- Reinforcement Learning

**Textbook**

- Tom Mitchell. Machine Learning. McGraw Hill, 1997.

**References**
- Christopher M. Bishop. Pattern Recognition and Machine Learning, Springer, 2006
- Ethem Alpaydin. Introduction to Machine Learning, MIT press, 2004.

**Last Update**
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