

Introduction to Machine Learning (CS-419)

Instructor: Saketh

1 Goals, Scope and Syllabus

This is an introductory course on Machine Learning. Though this course is for beginners, knowledge of probability theory and statistics is very essential. Additionally, it will be helpful if the student is familiar with basic engg. maths including Linear Algebra, Multi-variate Calculus and Optimization theory.

This course, though introductory, focuses on foundations and fundamentals rather than giving a bird's eye-view. Hence the development is technical with enough motivation provided wherever necessary.

The textbook for this course is “Machine Learning : A Probabilistic Perspective” by Kevin P. Murphy. It is highly recommended that every student procures a copy of this book. Broadly the topics are:

Bayesian Methods: Unsupervised learning, generative and discriminative models for supervised learning, generalized linear models, GMMs, HMMs, hierarchical Bayes and model selection.

Frequentist Approaches: Support Vector Machines and other kernel methods, boosting and decision trees.

After crediting this course the student should be capable of pursuing research problems in the field of machine learning or its applications. He will be familiar with some well-celebrated and basic models/algorithms for learning.

2 Evaluation Scheme

The course includes around 5 practical assignments that will be based on simulations on a computer. All these are compulsory. Failure to submit *any* one of these within the deadline will lead to an ‘FR’. Good performance in these assignments and in answering bonus questions floated during lectures etc. will be credited as “good-will”. I will shortly explain how good-will is used in grading.

The final marks (on 100) will be computed based on performance in:

1. Quiz-1 on 29th Jan, 2014 during quiz slot. 10% weightage.
2. Mid-sem exam. 30% weightage.

3. Quiz-2 on 21st Mar, 2014 during quiz slot. 10% weightage.
4. End-sem exam. 50% weightage.

Grades will be decided based on the final marks. Further, the good-will shall be used to promote or demote students by one grade. Good-will may also be used to determine the quality of the batch. If good batch then top grade is 'AA' or else 'AB' etc.

3 Contact

The course page is at <http://www.cse.iitb.ac.in/saketh/teaching/cs419.html>. Instructor's office: No. 306, Kanwal Rekhi Building. The instructor can also be contacted via phone: x7903 or email: saketh at cse anytime or using moodle interface. All communications to the students will be sent through moddle. All lecture and assignment material will be posted on course page.