CMPS 242 Syllabus, Winter ’05

The class has moved - CMPS 242 is now in Social Sciences II room 159 on TuTh from 2 to 3:45.

Here is a tentative syllabus for the Machine Learning class. Additional topics may be inserted and/or some topics may be skipped based on the interests of the class. The syllabus is aggressive, and it is unlikely that we will get to everything on this list. The text is *Machine Learning* by Tom Mitchell. You might find an introduction to probability as well as these other books useful:

- *Introduction to Machine Learning* by Alpaydin
- *Neural Networks for Pattern Recognition* by Bishop
- *Pattern Classification* by Duda, Hart and Stork or the earlier *Pattern Classification and Scene Analysis* by Duda and Hart

1. Introduction (ch 1)
2. Concept learning and PAC model (ch 2, sections 7.1-7.3)
3. Bayesian learning and parameter estimation (ch 6)
4. EM Algorithm (6.12) and K-means
5. Linear Discrimination and the Perceptron algorithm (4.4)
6. On-line prediction (7.5 and papers)
7. Batch learning: Decision Trees and Artificial Neural Networks (3 and 4)
8. Boosting (AdaBoost)
9. Support vector machines
10. Instance based learning (nearest neighbor) (ch 8)
11. Feature selection
12. Evaluating Hypotheses and model selection (ch 5)

Evaluation in the course will be based on periodic homework assignments (15–25%), an in-class midterm around the seventh week (30–40%) and a term project (40–50%).