CS 412: Artificial Intelligence (3-0-0: 3)

Introduction
Overview, Turing test, Intelligent agents

Problem Solving
Solving Problems by Searching: Uninformed search - Depth First Search, Breadth First Search, DFID, Heuristic search - Generate and Test, Best First Search, Beam Search, Hill Climbing, A*, Problem reduction search - AND/OR Graphs, AO*, Constraint satisfaction, Means-ends analysis, Stochastic search methods - Simulated Annealing, Particle Swarm Optimization, Game Playing - Minimax algorithm, Alpha-beta pruning

Knowledge and Reasoning
Building a knowledge base: Propositional logic, first order logic, Inference in first order logic, Resolution - refutation proofs, Theorem Proving in First Order Logic

Planning, partial order planning

Uncertain Knowledge and Reasoning, Probabilities, BayesianNetworks

Learning
Overview of different forms of learning: unsupervised, supervised, semi-supervised, K-means clustering algorithm, Decision Trees, Neural Networks

Advanced topics (subject to availability of time)
Introduction to Computer Vision, Introduction to Natural Language Processing, Introduction to Expert Systems, Introduction to Robotics

Text Books
1. S. Russell and P. Norvig, “Artificial Intelligence: A Modern Approach,” Prentice Hall
2. E. Rich, K. Knight and S. B. Nair, “Artificial Intelligence,” TMH

References
1. C. Bishop,“Pattern Recognition and Machine Learning," Springer
2.D. W. Patterson, “Introduction to artificial intelligence and expert systems,” Prentice Hall
3. A. C.Staugaard, Jr., “Robotics and AI: An Introduction to Applied Machine Intelligence,” Prentice Hall
4. I. Bratko, “Prolog Programming for Artificial Intelligence,” Addison-Wesley
5. S. O. Haykin, “Neural Networks and Learning Machines,” Prentice Hall
6. D.Jurafsky and J. H. Martin,“Speech and Language Processing,” Prentice Hall