CIS 786: Special Topics: Optimization  
Fall 2005
Basic Course Information

Instructor: Prof. J. Calvin, GITC 4311, calvin@njit.edu, 973-596-3378.

Office Hours: Tues. 3:15–5:15, Wed. 1:00–2:30, or by arrangement.

Prerequisites: Introduction to probability (Math 333 or equivalent) and introduction to algorithms (CIS 435 or equivalent).

Textbook: Sections of the course will be based on chapters of Introduction to Algorithms (Second Edition) by Cormen, Leiserson, Rivest, and Stein; MIT Press and McGraw Hill, ISBN: 0262032937. Other parts will rely on class handouts. If you do not have the book, you do not need to buy it.

Tentative Course Outline

1. Linear programming; formulation and examples; simplex method; duality.
2. Integer programming; applications, heuristic methods.
3. Stochastic dynamic programming; Markov decision processes; optimal routing.
4. Global optimization, randomized algorithms; simulated annealing; evolutionary algorithms.
5. Methods based on stochastic models; average-case analysis.
6. Optimization with noise-corrupted function evaluations.
7. Simulation-based optimization.

Grading: There will be biweekly problem sets. Optionally, a project can substitute for the last two problem sets. The purpose of the project is to propose and analyze an algorithm or investigate an optimization problem that arises in a field of interest to the student.

Academic Honesty: It is every student’s responsibility to understand and adhere to the provisions of the academic honor code.

Students will be consulted regarding any changes to the syllabus.