COURSE SYLLABUS B60.4306.20
DYNAMIC PROGRAMMING & STOCHASTIC CONTROL

SPRING 2007

Meetings: Wednesday 3:30pm-6:30pm, KMC 8-170.

Instructor: Dr. Gustavo Vulcano, KMC 8-76, 998-4018, gvulcano@stern.nyu.edu
Office hours: Monday 10:45pm – 12:00pm,
Tuesday 12:30am-1:30pm, or by appointment.

Overview
This course covers the basic models and solution techniques for problems of sequential decision making under uncertainty (stochastic control). We will also discuss some approximation methods for problems involving large state spaces.

References:
1. Bertsekas, D. P. Dynamic Programming and Optimal Control. 2nd ed. Belmont, MA. Athena Scientific, 2000.
2. Puterman, M.L. Markov Decision Processes. John Wiley & Sons, 1994.

Prerequisites: An introductory probability course (including basic knowledge of Markov chains). Familiarity with MATLAB or similar software is also recommended.

Grading: Homeworks 20%; Midterm 40%; Final 40%

Topics:

1. Introduction to dynamic programming, examples, problem formulation. The dynamic programming algorithm.
2. Deterministic systems and the shortest path problem.
3. Deterministic continuous-time optimal control.
4. Problems with perfect state information.
5. Problems with imperfect state information.
6. Suboptimal control.
7. Introduction to infinite horizon problems.