

Advanced Dynamic Programming for Spring 2011
OR 774/IT774
Prereq: OR 674 or permission of instructor
Instructor: Dr. Rajesh Ganesan

This course covers advanced topics on the theory and practice of dynamic programming, i.e. optimal sequential decision making over time in the presence of uncertainties. The course will stress on the mathematical foundations and will introduce the theory, computational aspect, and applications of approximate dynamic programming for stochastic DP problems. The course will use Matlab.

Text: Approximate DP, Warren Powell, Wiley Publishers

Notes prepared from

- Neuro-Dynamic Programming (Optimization and Neural Computation Series, 3) by Dimitri P. Bertsekas, John N. Tsitsiklis
- Markov Decision Processes: Discrete Stochastic Dy. Programming by M. L. Puterman
- Reinforcement Learning by Sutton and Barto

Topics

Review: Dynamic Programming Algorithm
 Deterministic Systems, Shortest path Algorithm
 Stochastic DP

Introduction to ADP Algorithms
Stochastic Approximation
Convergence and optimality
Reinforcement learning
ADP: value function approximation

Student Evaluation Criteria

Mid-term:	40%
Case study discussion	20%
Final Exam:	40%

Academic Policy:

All academic policies as given in the Honor System and code will be strictly followed. Visit URL <http://www.gmu.edu/catalog/apolicies/#Anchor12>

Grades:

Letter grades will be decided as follows:

97% and above -A⁺, 94-96% - A, 90-93% -A⁻, 86-89- B⁺, 83-85%-B, 80-82%-B⁻,
76-79% - C⁺, 73-75% - C, 70-72%-C⁻, 66-69%-D⁺, 63-65%-D, 60-62%-D⁻, at or
below 59%-F

Please visit <http://classweb.gmu.edu/rganesan> to check for announcements, Hw problems, and solutions