

Economics 720.01
Mathematics for Economists
Fall 2003

Tuesday and Thursday, 1:30-3:30 pm
Carney Hall, Room 011

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Office Hours: Tuesday, 12-1 pm and Thursday, 3:30-4:30 pm

<http://www2.bc.edu/~irelandp/ec720.html>

Course Description

This course will introduce you to a variety of mathematical tools that are useful in analyzing dynamic economic models. These tools include: (i) methods for solving dynamic optimization problems and (ii) methods for solving differential and difference equations.

Course Materials

Copies of my lecture notes are available at the Boston College Bookstore; these will serve as the main text for the course. Two books that you may also find helpful are:

Dixit, A.K. *Optimization in Economic Theory* (2nd ed). Oxford University Press, 1990.

Simon, Carl P. and Lawrence Blume. *Mathematics for Economists*. W.W. Norton, 1994.

Course Requirements

Your grade for this first part of Economics 720 will be based on a final exam, to be held on Thursday, October 16 from 1:30 to 3:30 pm.

Problem Sets

Problem sets will be handed out periodically and collected on dates announced ahead of time in class.

Strictly speaking, these problem sets will not factor into the determination of your grade for this course. Nevertheless, I strongly encourage you to work through and hand in the problem sets. The teaching assistant and I will review them carefully, to make sure that you are following along with the material that is presented in class. Also, the questions on the final exam will resemble quite closely, both in format and content, the questions from the problem sets. By working through the problem sets, you will therefore be preparing for the exam.

For your convenience, extra copies of the problem sets will be available through the course webpage, listed above.

Office Hours

I will hold regular office hours on Tuesdays from 12 to 1 pm and on Thursdays from 3:30 to 4:30 pm. I will also be available at other times; to make an appointment, you can reach me by phone at 552-3687 or by email at irelandp@bc.edu.

Course Outline

Dynamic Optimization

1. Two Useful Theorems
Dixit, Chapters 2, 3, and 5
Simon and Blume, Chapters 18 and 19
2. The Maximum Principle
Dixit, Chapter 10
3. Dynamic Programming
Dixit, Chapter 11

Differential and Difference Equations

4. Eigenvalues and Eigenvectors
Simon and Blume, Chapter 23
5. Differential Equations
Simon and Blume, Chapters 24 and 25
6. Difference Equations
Simon and Blume, Chapter 23