

**Economics 720.01**  
**Mathematics for Economists**  
**Fall 2001**

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

**Professor Peter N. Ireland**  
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### **Course Description**

This first part of Economics 720 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**

Xerox 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* (2<sup>nd</sup> ed). Oxford University Press, 1990.

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

### **Course Requirements and Grading**

Ten percent of your grade for this first part of Economics 720 will be based on a series of five or six problem sets. These problem sets will be handed out periodically and collected on due dates announced ahead of time in class. For the purposes of grading, late problem sets will not be accepted.

The remaining ninety percent of your grade will be based on a final exam, to be held on a date that will also be announced ahead of time in class.

## **Office Hours**

I am in my office (Carney Hall, Room 131) almost every afternoon. Feel free to stop by whenever I'm around. Alternatively, if you'd like to make an appointment, you can reach me by phone at 552-3687 or by e-mail 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