

UNIVERSITY OF DELAWARE
DEPARTMENT OF MATHEMATICAL SCIENCES
September 1, 2011

COURSE: MATH/ECON 530 Applications of Mathematics in Economics Sections 10/80
CLASS MEETINGS: Mon., Wed., 3:30-4:45, Memorial Hall Room 127
INSTRUCTOR: T. S. Angell
OFFICE: 413 Ewing Hall (302) 831-2250
EMAIL: angell@math.udel.edu
OFFICE HOURS: Mon. & Wed. 10:00-11:00, 12:15-1:30 or by appointment
TEXT BOOK: M. D. Intriligator, *Mathematical Optimization and Economic Theory*.
G. Debru, *Theory of Value*

**Approximate
Number of
Lectures**

Mathematical Background:

Review of basic analysis and vector spaces
Ordered Vector Spaces and Preference Structures
Convex Sets and Convex Functions
Separation Theorems
Fixed point theorems
Multi-functions and Kakutani's Fixed Points Theorem

5

Dynamic Optimization:

Discrete vs. Continuous Dynamic Models
Elements of the Calculus of Variations
Ramsey's Growth Model and Samuelson's Turnpike Theorem
Pontryagin Multipliers and Necessary Conditions
Infinite Horizon Problems and Renewable Resources

8

Elementary Theory of Games:

Two-person Zero-sum Games
Connections with Linear Programming
n-person Games in Normal Form
Mixed Strategies
Fixed Points and Nash Equilibria

7

GRADING: Grades will be based on

- | | |
|----------------------------------|-------------------|
| (1) A set of homework problems: | approximately 40% |
| (2) A mid-term examination: | approximately 25% |
| (3) A final written examination: | approximately 35% |

Final course grade determined on performance:

You are *guaranteed* the following grades if your percentage score meets the cut-offs:

$$A^- \geq 90\%, B^- \geq 80\%, C^- \geq 70\%, D^- \geq 60\%, F < 60.$$

Comments:

1. There will be **NO** make-up examinations, except when mandated by university rules. If you should miss an examination, your other exam scores will be averaged provided you have a valid excuse from the Dean's Office or Health Center. Unexcused absences will result in a grade of zero. You *must* take the final on the scheduled day and time.

2. **NO** late homework will be accepted.
3. You may consult with other students, but the work you hand in must be your own and **NOT** copied from others. Duplicate papers will receive a grade of **F**. For complete information on the University Policy on Academic Dishonesty, consult the on-line *Student Handbook* at

<http://www.udel.edu/stuguide/11-12/code.html>

4. Note that the drop date for the Fall Semester is Tuesday, October 25.