

**Boston College
Department of Economics**

Mathematics for Economists I

EC730.01
Fall 1997
T, W, Th, F, 10:30-12:00
Campion 235

Chong-en Bai
148 Carney, x3690
Office Hours: Wed. 3:00-5:00
or by appointment

Textbooks:

S&B: Carl S. Simon and Lawrence Blume, Mathematics for Economists, Norton.
(Required)

Dixit: Dixit, A. K., Optimization in Economic Theory, Oxford University Press.

There will be a midterm and a final exam. Problem sets will be handed out periodically and partially graded. The course grade will be determined by the following formula:

Problem Sets	20%
Midterm	35%
Final	45%

Part I

1.1 Implicit functions and their derivatives

S&B Ch. 15.

1.2 Homogeneous functions and homothetic functions

S&B: Ch. 20

1.3 Taylor expansion of one-variable and multi-variable functions

S&B: 30.2, 30.3.

Part II

2.1 One variable optimization: first and second order conditions

S&B: 3.5, Dixit Ch. 8.

2.2 Quadratic forms

S&B: 16.1, 16.2.

2.3 Multi-variable optimization
S&B: 17.1 - 17.3, Dixit Ch. 8.

2.4 Convex and concave functions
S&B: 17.4.

Part III

3.1 Constrained optimization, with equality constraints
S&B: 18.2, 19.1, 19.3, Dixit Ch. 2, 4, 8.

3.2 Quasi convex and quasi concave functions
S&B: 21.3, Dixit Ch. 6.

3.3 Envelop theorems
S&B: 19.2, Dixit Ch. 5, 8.

2.4 Kuhn-Tucker conditions
S&B: 18.6, 19.3 - 19.5, Dixit Ch. 3, 4, 7.

Part IV

3.1 Differential equations: first-order
S&B: 24.1, 24.2, 24.5.

3.2 Differential equations: higher-order
S&B: 24.3.

3.3 Systems of differential equations
S&B: 25.1 - 25.3.

3.4 Difference equations
S&B: Ch. 23.