

MACQUARIE
UNIVERSITY



FACULTY OF
BUSINESS AND ECONOMICS

ECON864
Mathematical Economics
First Semester, 2011

Unit Outline

Department of Economics

1 Introduction

In this course we cover many topics in mathematics which are used in economic analysis. The formal prerequisite is a first year university course in calculus and linear algebra. The courses Math 135 and Math 136 offered at Macquarie University should offer adequate preparation, however hard work and some intellectual maturity can compensate for any missing background. Indeed hard work and some intellectual maturity are required even with adequate prior mathematics.

We will be using the text book by Alpha C. Chiang and Kevin Wainwright, [ACC05], *Fundamental Methods of Mathematical Economics*, the Shaum's outline *Introduction to mathematical economics* by Edward T. Dowling [Dow01], and the linear algebra textbook which can be downloaded from <http://joshua.smcvt.edu/linearalgebra/>.

Usefull additional references include a calculus book such as Stewart's *Calculus*, [Ste99], and a linear algebra book such as Anton's *Elementary linear algebra*, [Ant00].

2 Week by Week Outline

Week 1 Linear systems, Gauss-Jordan elimination

Week 2 Matrix algebra, vectors

Week 3 Geometry of linear transformations, determinants

Week 4 Cramer's rule applications of matrices

Week 5 Eigenvalues and eigenvectors, diagonalization

Week 6 Foundations, limits, continuity, derivatives

Week 7 Optimization in one variable, Taylor Series

Week 8 derivatives, applications, partial derivatives

Week 9 applications of partial dervatives, Jacobian Derivatives

Week 10 Differentials Comparative-Static Analysis Total Derivatives

Week 11 Optimization in several variables, applications

Week 12 constrained optimization

Week 13 Non-linear programming

3 Assessment

There will be four homework assignments each worth 5%, an early semester online quiz worth 5%, a mid-semester test during the eighth week of class worth 20%, a late semester online quiz in week eleven, and a final exam at the end worth 50%.

Assessment	%	Date	Due
Homework 1	5%	Week 4	Week 7
Homework 2	5%	Week 5	Week 8
Homework 3	5%	Week 7	Week 11
Homework 4	5%	Week 10	Week 14
Early Semester Online Quiz	5%	Week 4	Week 6
Late Semester Online Quiz	5%	Week 11	Week 13
Mid-Semester Test	20%	Week 8	
Final Exam	50%	Exam Period	

Table 1: Econ864 Assessment 2011

References

- [ACC05] Kevin Wainwright Alpha C. Chiang, *Fundamental methods of mathematical economics*, 4 ed., McGraw-Hill/Irwin, New York, 2005.
- [Ant00] Howard Anton, *Elementary linear algebra*, 8 ed., John Wiley & Sons, New York, 2000.
- [Dow01] Edward T. Dowling, *Introduction to mathematical economics*, McGraw-Hill, 2001.
- [Ste99] James Stewart, *Calculus*, 4 ed., Brooks/Cole Publishing Company, 1999.