Aims

This course provides an introduction to basic mathematics for economics students. It is aimed at students who have not specialised in mathematics. Much of the course is concerned with algebraic manipulation and solving equations. This is vital for later topics and other areas of study, since the development of algebraic skills is important.

Syllabus

**Algebra and Geometry Revision**: The use of brackets, Manipulation of fractions, Manipulation of powers (3 lectures)

**Linear functions**: Definition, properties and graphs of linear functions, Systems of linear equations and their solution, Application to linear systems of demand and supply, Application to linear macroeconomic systems (3 lectures)

**Quadratics and factorization**: Quadratic expressions and factorisation, Quadratic equations, Quadratic functions: definition, roots and graphs, Application to quadratic systems of demand and supply, Application to cost and revenue functions (3 lectures)

**Cubic and other functions**: Cubic functions and total cost functions, The rectangular hyperbola and demand functions, Inequalities (3 lectures)

**Differentiation**: Basic rules of differentiation, maxima and minima, curve sketching. (6 lectures)

**Arithmetic and geometric series**: Arithmetic and geometric series, Compound interest and growth, Discounting future values (3 lectures)

**Exponential and logarithmic functions**: Exponential and logarithmic functions, Manipulation of logarithmic functions, Application of exponential function to continuous growth, Application of exponential function to discounting and present value (3 lectures)

**Matrix algebra**: Matrices and vectors, algebraic manipulations, determinants, inverse matrices, solution of multi-variable linear equations (6 lectures)

**Economic applications of functions and derivatives**: Total cost function, average cost function, marginal cost, demand total revenue, profit maximization (3 lectures)

Teaching and Assessment

**Contact Hours**: 3 lectures and 1 tutorial per week

**Assessment**: 20% by class tests or other continuous assessment

**Resit Type**: exam

Content: Oct 2013
By the end of the course, students should be able to:

- be able to simplify algebraic expressions
- understand exponents
- know simple algebraic identities
- solve linear equations
- find the gradient and the equation of a straight line
- factorise quadratics
- know the formula for solving a quadratic equation
- sketch the graph of a quadratic
- solve equations by factorisation
- manipulate cubic expressions
- differentiate simple functions, calculate maxima and minima, sketch curves
- be familiar with the rectangular hyperbola and demand functions
- be able to solve inequalities
- manipulate expressions involving arithmetic and geometric series
- calculate compound interest and discounted future values
- manipulate and evaluate simple expressions involving log and exp
- be able to apply exponential functions to growth and present value problems
- be able to apply matrix algebra to solve linear equations with many variables