

MA100 Mathematical Methods

Course content

This is an introductory level course for those who wish to use mathematics seriously in social science, or in any other context. A range of basic mathematical concepts and methods in calculus of one and several variables and in linear algebra are covered and some applications illustrated. It is an essential pre-requisite for any mathematically orientated economics options and for many further mathematics courses. Topics covered: Matrices, reduced row echelon form, rank. Systems of linear equations, Gaussian elimination. Determinants. Vector spaces, linear independence, basis, dimension. Linear transformations, similarity. Eigenvalues. Diagonalization. Orthogonal diagonalization. Complex numbers. Vectors. Functions of several variables, derivatives, gradients, tangent hyperplanes. Optimisation including Lagrange's method. Vector-valued functions, derivatives and their manipulation. Inverse functions, local inverses and critical points, use in transformations. Integration, differential and difference equations. Some applications of the above topics.