MT2 - Teaching Aims and Objectives

Aims

The aim of this course is to teach essential mathematical skills which are necessary for a wide range of work in physics.

Objectives

By the end of this course, a student would be expected to be able to:

1. Understand and use basic complex analysis, in particular the symbol `i', multiplication, graphical representation, polar form, exponential form and roots.

2. Have a familiarity with double and triple integrals, polar and spherical coordinates, line and surface integrals and coordinate transformations.

3. Use and understand the meaning of scalar and vector quantities, vector components, addition, direction cosines, scalar and vector products, angle between vectors, vector differential operators, div, grad and curl and properties.

4. Comprehend matrices, their order and type, operations, inverse and transpose, symmetry, orthogonality, Hermiticity and unitarity, determinants, eigenvalues and eigenvectors, use in solving linear systems of equations.

5. Know the elements of Fourier expansions, coefficient formulae and applications.

6. Be able to solve simple first order systems, using particular integrals and complementary functions.

7. Have a working knowledge of the use of the Maple package for solving mathematical problems, basic syntax and techniques, sources of error, cross-checking, simple applications, use in more complicated problems arising in all the above subjects.