School of Mathematics

Course 131 — Mathematical Methods & Linear algebra 1998-99
(JF Mathematics, Theoretical Physics & Two-Subject Moderatorship)

Lecturer: Professor P.S. Florides

Requirements/prerequisites: None

Duration: 24 weeks

Number of lectures per week: 3

Assessment:

End-of-year Examination: 3 hour paper in June

Description:
General introduction to vectors and linear vector spaces, vectors in 3-dimensions, application to 3-dimensional geometrical problems.

Review of calculus in 1-dimension, curve tracing, introduction to partial differentiation, the operator ∇ and its geometrical significance, Taylor expansions, maxima and minima. Multiple integrals, line, surface and volume integrals, change of variable, Jacobians. Introduction to Gauss and Stokes theorems. Linear differential equations.

Matrices and their application, solution of a system of linear equations, eigenvalues and eigenvectors of real symmetric matrices, diagonalization of matrices.

References

1. G. H. Thomas Jr and R. L. Finney : Calculus and Analytic Geometry

2. D. E. Bourne and P. C. Kendall : Vector Analysis and Cartesian Tensors

June 10, 1998