School of Mathematics

Course 1S2 — Mathematics for Science students 2000–01
(JF Mathematics as a whole subject within the Natural Science Moderatorships (for those taking Physics). JF Computational Physics and Chemistry. JF Physics & Chemistry of Advanced Materials. )

Lecturer: Dr. B. Redmond

Requirements/prerequisites: None

Duration: 24 weeks

Number of lectures per week: 2 lectures per week plus a tutorial every third week.

Assessment: Two end-of-term assignments assignment will each count for 10% of the marks for section 2.

End-of-year Examination: Three 3-hour exam. Result is combined with results of 1S1 and 1S3.

Description: Vectors and linear algebra, differential equations, and applications to physical examples.

More detailed outline:

- Vectors, addition, scalar product, cross product, vector equation of a line in 3 dimensions, triple vector product, differentiation. (Anton (Calculus): 13.1–13.6)
  Parametric equations (Anton (Calculus): 1.7); cylindrical coordinates (Anton (Calculus): 13.8).

- Matrices, systems of linear equations, determinants. (Anton&Rorres: Chapters 1-2)

- Ordinary Differential Equations of first and second order. Linear differential equations with constant coefficients. Nonhomogeneous. (Kreysig: from Chapter 1-2)

- Applications/Examples: Simple Harmonic motion, with and without resistance. Electric circuits. Radioactive decay. Motion in a resisting 1-dimensional medium. (Anton (Calculus): Chapter 10, Kreysig: from Chapter 1–2)

Essential Reference


Recommended references


October 19, 2000