

School of Mathematics

Course 1S4 — Mathematics for Science students 2003–04
(JF Mathematics as a whole subject within the Natural Science Moderatorships (those not taking Physics). JF Human Genetics. JF Medicinal Chemistry.)

Lecturer: Dr. N. H. Buttimore

Requirements/prerequisites: None

Duration: 24 weeks

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

Assessment: Assignments will count for ?% of the mark.

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

Description:

- Vectors, geometric, norm, vector addition, dot product, application of angle between vectors as measure of genetic distance
- Systems of linear equations and Gauss-Jordan elimination; application to the geological science of mineralogy Matrices, inverses, diagonal, triangular, symmetric, trace, application to geographical distribution, and application to colour
- Determinants, evaluation by row operations, properties, vector cross products, eigenvalues and eigenvectors
- Nonlinear recurrences and applications to discrete biomass evolution, periodic cycles and their stability properties
- Differential equations, system of first order linear equations, applications to symbiotic and prey-predator population dynamics.

See <http://www.maths.tcd.ie/~nhb/1S4.php> for additional information.

References:

1. H. Anton & R. C. Busby, Contemporary Linear Algebra, John Wiley
2. H. Anton & C. Rorres, Elementary Linear Algebra: applications version, John Wiley
3. David C. Lay, Linear Algebra and its applications, Addison-Wesley Longman.
4. Ron Larson & B. Edwards, Elementary Linear Algebra, Houghton Mifflin Company