

School of Mathematics

Course 1S2 — Mathematics for Science students 2005–06
(JF Mathematics as a whole subject within the Natural Science Moderatorships.)

Lecturer: Dr. N. Buttimore

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 hour exam. Result is combined with results of 1S1 and 1S3.

Description: See <http://www.maths.tcd.ie/~nhb/1S2.php> for more detailed information.

Vectors and linear algebra, differential equations, and applications to scientific examples.

More detailed outline:

- 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 and Laplace expansion, properties, vector cross products, eigenvalues and eigenvectors
- Differential equations, system of first order linear equations, applications to population dynamics, linear second order equations.

Recommended 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

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