School of Mathematics

Course 1E2 – JF Engineering & JF MSISS 2000-01
(JF Engineers & JF MSISS)

Lecturer: Dr. Donal O'Donovan

Requirements/prerequisites: None

Duration: 24 weeks

Number of lectures per week: 3, including 1 tutorial

Assessment:

End-of-year Examination:

Description:

- Liinear Algebra:
  - Systems of linear equations and matrices
  - Determinants
  - Vectors in 2-space and 3-space
  - Eigenvalues and eigenvectors, diagonalization
  - Application to differential equations, quadratic forms, LU decomposition, least squares method..
- Probability and Statistics:
  - Probabilities, mutual exclusivity and independence
  - Conditional probbaility and Bayes' theorem
  - Binomial, Poisson and normal distributions
- Differential equations: First order, separating variables, exact, linear. Second and higher order linear with constant coeffecients.
- Introduction to partial derivatives, conic sections, polar coordinates.
- Complex variable, difference equations.

Textbooks:
H. Anton, Elementary Linear Algebra (7th ed), Wiley, 1994. (Chapters 1–3, sections 4.2, 4.3, 6.1, 6.2, 8.1, 8.3)
G. B. Thomas & R. L. Finney, Calculus and Analytic Geometry (9th edition), Addison-Wesley 1996. (Sections 9.1–9.3, 9.6, 9.7, 12.3).

November 13, 2000