

School of Mathematics

Course 1E2 – Engineering Mathematics II
(JF Engineers & JF MSISS & JF MEMS)

2008-09

Lecturer: Dr. D.P. O'Donovan

Requirements/prerequisites:

Duration: 12 weeks (second semester)

Number of lectures per week: 3 lectures and 1 tutorial per week.

Assessment: The Course grade will be a maximum of 20% Assignments, 20% Midterm and 60% Final Exam and 100% Final Exam.

End-of-year Examination: 2 hour end of year examination.

Description:

Engineering Maths II is a half year course that concludes the study of the calculus of functions of one variable and begins the study of linear algebra. The course emphasizes both the theoretical foundations of the integral calculus and the application of mathematical methods. The course gives an introduction to modeling with differential functions and power series approximations. The linear algebra begins the study of systems of linear equations, which aims to motivate the further study of linear algebra and linear transformations in Engineering Maths III.

Learning outcomes Upon completion of this course, students will be able to:

- Integrate by parts
- Integrate trigonometric and rational functions
- Formulate and solve a first order differential equation
- Determine if a sequence converges or not
- Test a series for convergence
- Approximate a function by polynomials
- Calculate solutions to systems of linear equations by different methods and describe why some methods are more efficient than others.

Course content

- evaluation of integrals;
- notion of a differential equation;
- polynomials, sequences and series, including simple convergence tests; Taylor and Maclaurin Series.
- Gaussian Elimination

- Matrix Algebra
- Theorems on existence of matrix inverses
- Determinants

Teaching strategies The teaching strategy is a mixture of lectures and problem-solving tutorials. The format of lectures is conventional, however, the atmosphere is informal, and interaction and discussion is normal. Students are encouraged to ask questions in the lectures. In the tutorials, the students work on problems to practice and apply the methods introduced in the lectures. Discussion of problems in small groups is encouraged and facilitated.

November 7, 2008