School of Mathematics

Module MA2331 — Equations of mathematical physics I 2011-12
(SF Mathematics, SF Theoretical Physics, JS & SS Two-subject Moderatorship)

Lecturer: Prof. D. McManus

Requirements/prerequisites:

Duration: Michaelmas term, 11 weeks

Number of lectures per week: 3 lectures including tutorials per week

Assessment:

ECTS credits: 5

End-of-year Examination: This module will be examined jointly with MA2332 in a 3-hour examination in Trinity term, except that those taking just one of the two modules will have a 2 hour examination. However there will be separate results for MA2331 and MA2332.

Description: (Preliminary.) Vector analysis; Theorems of Gauss and Stokes; Fourier series and Fourier integrals; Ordinary Differential Equations; Hermite polynomials, Bessel Functions.
Objectives:
Introduction to basic techniques of applied mathematics, with applications.

Learning Outcomes: On sucessful completion of this module, students will be able to:

- compute the real and complex Fourier series of a given periodic function;
- evaluate the Fourier transform of a given non-periodic function;
- evaluate integrals containing the Dirac delta distribution;
- compute the gradient of a given scalar field and the divergence and curl of a given vector field;
- calculate line and surface integrals;
- apply their knowledge to relevant problems in mathematics and physics.

November 11, 2011