School of Mathematics

Module MA2331 — Equations of mathematical physics I 2010-11
(SF Mathematics, SF Theoretical Physics, JS & SS Two-subject Moderatorship)

Lecturer: Dr. Sinéad Ryan

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.

Description: (Preliminary.) Vector analysis; Theorems of Gauss and Stokes; Fourier series and Fourier integrals; Ordinary Differential Equations; Hermite polynomials, Bessel Functions. Approximately the first half of previous module 231. Refer to http://www.maths.tcd.ie/pub/official/Courses08-09/231.html

Objectives:
Introduction to basic techniques of applied mathematics, with applications.

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

• compute the real and complex Fourier series of periodic functions;
• calculate the Fourier transform of nonperiodic functions;
• identify a Dirac delta function integral and apply it to the solution of integrals;
• compute the gradient of scalar fields and the divergence and curl of vector fields;
• compute line and surface integrals;
• apply their knowledge in mathematical and physical domains where relevant.

September 12, 2011