School of Mathematics

MA3469 — Practical numerical simulations 2011-12
(SS Theoretical Physics, JS & SS Mathematics)

Lecturer: Prof. M. Peardon

Requirements/prerequisites:

Duration: Michaelmas Term, 11 weeks

Number of lectures per week: 2 lectures and 1 tutorial

Assessment: 3 programming assignments, each worth 10%. 70% exam

ECTS credits: 5

End-of-year Examination: 2 hour exam in Trinity Term

Description:
Textbooks:

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

- show familiarity with basic usage of the C++ programming language
- recognise the numerical algorithms suitable for finding approximate solutions to ordinary differential equations
- recognise the numerical algorithms suitable for finding approximate solutions to partial differential equations
- explain how Monte Carlo simulation can approximate solutions to high-dimensional integration and summation problems
- write software in C++ to construct numerical solutions to questions that arise in theoretical physics.
- discuss the problems that arise in using numerical solutions

November 2, 2011