## **School of Mathematics**

## Course 342 — Practical computational simulations. 2000-01 (JS Theoretical Physics, JS Mathematics, JS Computational Science.)

Lecturer: Dr. Mike Peardon

Requirements/prerequisites: Some knowledge of C programming.

Duration: Michaelmas term.

Number of lectures per week: 1 lecture per week, with a 1 hour lab class.

Assessment: Assessment is through lab attendance and assignments and a project.

End-of-year Examination: None.

## **Description:**

The course provides a practical introduction to some numerical techniques for simulating physical systems.

- The C compiler: Using the C compiler, command line arguments, file input/output, structures, linking to libraries.
- Matrix methods: inversion, eigenvalues and eigenvectors.
- Finite difference methods: solving ODEs and PDEs.

## Textbooks:

- UNIX in a Nutshell, Robbins. O'Reilly Publishing. ISBN: 1-56592-427-4.
- Practical C Programming, 3rd Edition, Oualline. O'Reilly Publishing. ISBN: 1-56592-306-5.
- Numerical Recipes in C, Press, Teukolsky, Vetterling and Flannery. Cambridge. ISBN: 0-521-43108-5. Online: http://www.nr.com/

October 13, 2000