Aims

This is a second level module aimed at students entering directly into the second year of a Mathematics degree. It is designed to assist students to get to grips with second year Mathematics, by reviewing material from first year that they may have not covered in their school syllabus. The precise topics covered will vary from student to student, depending on background. For this reason much of the course will be self-taught by directed reading, handout material etc., backed up by direct teaching in small groups.

Syllabus

Topics from the following, depending on individual student background.

**Algebra:** Set theory, complex numbers, matrices, vectors.

**Calculus:** Limits, differentiation, sequences and series, integration, differential equations, modelling through first and second order differential equations.

**Computer Algebra:** Introduction to MAPLE (a Computer Algebra package for general mathematical use).

Teaching and Assessment

| Contact Hours: | 1-3 per week, arranged on individual basis as required |
| Assessment:    | 100% by class tests or other continuous assessment |
| Resit Type:    | 0% by end of course 2-hour exam |
|                | exam |

Content: September 2009
By the end of the course, students should be able to:

- understand and be able to use the language of sets, Venn diagrams, etc.
- perform standard algebraic manipulations on complex numbers
- add and multiply matrices, compute determinants
- manipulate vectors, compute scalar product and vector product
- differentiate and integrate standard functions
- determine convergence or otherwise of sequences and series; compute limits
- solve simple first and second order differential equations
- develop the first order differential equation to model physical situations involving growth and decay
- solve problems on projectile motion in 1D
- use MAPLE as a mathematical tool

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