

# MAS115 Calculus I 2006-2007

Level 1: Semester 1

*Lecturer:* Dr T. Prellberg (Mathematics)

*Lecture times:* Tuesday 9-10 (Skeel), Thursday 10-11 (Skeel) and Friday 1-2 (Skeel)

*Exercise classes:* (starting Wednesday, October 4):

Wednesday 10-11: FB 326 (Prellberg), Queens FB1 (Carr), CS 446 (Tavakol), Maths 103 (Jerrum), Eng 216 (Just)

Wednesday 11-12: Law 102 (Jerrum), Eng 304 (Carr), PUG1 (Tavakol), Maths 103 (Just)

Exerciseclass assignment to be announced.

*Attendance registers:* Attendance registers will be taken during exercise classes. We will terminate college registration of students who fail to submit coursework and do not attend exercise classes.

*Office hours:* Tuesday 10:30-11:30, Thursday 11:30-12:30, Friday 10:30-11:30 (Maths 113)

*Weekly exercise routine:* Exercises/Coursework available by Wednesday of week  $n$  on MyMathLab. Please log in and register at <http://www.coursecompass.com>. Work can be entered into MyMathlab until 10:30am on Wednesday of week  $n + 1$ . Marks will be available on MyMathLab.

The first coursework is *due* on October 4!

Test/revision week: Weeks 7 and 12 will be used for revision lectures/tutorials and tests.

*Calculators:* Calculators may NOT be used in the final examination or in the in-course tests.

*Assessment:* 80% final examination (May 2007) + 20% for course work and two in-course tests.

## Syllabus

1. Real numbers and the real line. Manipulation of algebraic equations and inequalities involving the square root. Manipulation of trigonometric identities.
2. Functions and their graphs. Composition of functions and functional inverse. Inverse trigonometric and hyperbolic functions.
3. Limits and continuity.
4. Differentiation: derivatives as the instantaneous rate of change and basic rules of differentiation, technical dexterity of finding derivatives to be checked using test assessments.
5. Application of derivatives: graph sketching, extreme values, monotone functions, indeterminate forms and L'Hospital's Rule.
6. The indefinite integral and basic rules of integration (technical dexterity of integration skills to be checked using test assessments). Separable and first order linear differential equations.
7. The definite integral and Fundamental Theorem of Calculus. Applications of definite integrals (area, volume, arc-length).
8. Polar coordinates. Graph sketching in polar coordinates.

## Books

MAS115 Calculus I and MAS125 Calculus II follow *Thomas' Calculus, 11th international edition*. They make use of an interactive maths web site MyMathLab which is tied up to the book. The book and access code to MyMathLab are sold at a discounted rate of 30£ in the Mathematics Office.