

MTH5105 Differential and Integral Analysis 2008-2009

Level 5: Semester 4

Lecturer: Dr T. Prellberg (Mathematics)

Lecture times: Monday 11-12 (FB 102.6), Thursday 11-12 (FB 102.6) and Friday 2-3 (FB 115)

Exercise class: (starting Friday, January 16):

Friday 10-11 (MAS 103): Surnames A-K

Friday 3-4 (FB 115): Surnames L-Z

Office hours: Monday 1-2, Thursday 1-2, Friday 1-2 (MAS 113)

Weekly exercise routine: Exercise sheet available on Monday from the web page

<http://www.maths.qmul.ac.uk/~tp/MTH5105/>

The deadline will be 12:15 on Mondays: either hand in work at the end of the Monday lecture or in my office MAS113 immediately afterwards. Include your **name** and **student number** on each sheet handed in. Cwk/test marks will be posted weekly on Saturdays to your college email address, the first posting will be at the end of week 4.

Random attendance registers: Attendance will be checked during lectures. We will terminate college registration of students who fail to submit coursework and do not attend lectures.

Test/revision week: There will be a midterm test in week 7.

Calculators: Calculators may NOT be used in the final examination or in the midterm test.

Assessment: 80% final examination + 10% mid-term test + 10% coursework

Syllabus

1. Differentiable functions: Definition of differentiability. Algebra of derivatives, chain rule. Derivative of inverse function. Rolle's Theorem, Mean Value Theorem and applications. Taylor's Theorem.
2. Integration: Darboux definition of Riemann integral, simple properties. Continuous functions are integrable (via uniform continuity). Fundamental Theorem of the calculus, integral form of the Mean Value Theorem and of the remainder in Taylor's Theorem; applications to some well known series (log, arctan, binomial). Improper integrals.
3. Sequences of functions: pointwise and uniform convergence. Weierstraß M-test. Term-by-term integration of power series.

Books

Main text:

- R Haggerty, Fundamentals of Mathematical Analysis (Addison-Wesley)

Other texts:

- J Stewart, Single Variable Calculus, (Brooks/Cole Publishing Company, 4th edition, 1999)
- C Clark, Elementary Mathematical Analysis (Wadsworth, 1982)
- M D Hatton, Mathematical Analysis (Hodder and Stroughton, 1977)
- B M Mitchell, Calculus (without analytic geometry) (Heath, 1969)