THE UNIVERSITY OF SYDNEY
Semester 2, 2009

Information Sheet for **MATH1903 Integral Calculus and Modelling (Advanced)**

Web Site
It is important that you check the Junior Mathematics web site regularly.
It may be found through WebCT, by following links from the University of Sydney front page, or by going directly to

`http://www.maths.usyd.edu.au/u/UG/JM/`

Important announcements relating to Junior Mathematics are posted on the site, and there is a link to the MATH1903 page. Material available from the MATH1903 page may include information sheets, the Junior Mathematics Handbook, notes, exercise sheets and solutions, and previous examination papers.

Lectures

Times	Location	Lecturer	Consultation
8 am Thu & Fri	Chemistry LT 1	Weeks 1–6, 13: Dr J Parkinson, Carslaw room 614	Thurs, 1-2pm
		Weeks 7–13: A/Prof H Dullin, Carslaw room 714	Tues, 1-2pm

Lectures run for 13 weeks. The last lecture will therefore be on Friday 29 October.

Tutorials
Tutorials (one per week) start in week 2. You should attend the tutorial given on your personal timetable. Attendance at tutorials will be recorded. Your attendance will not be recorded unless you attend the tutorial in which you are enrolled.

Tutorial sheets
The tutorial sheets will be available on the MATH1903 webpage. **You must take the current week's sheet to your tutorial.** The sheet must be printed from the web.
Solutions to tutorial exercises for week n will usually be posted on the web by the afternoon of the Friday of week n.

Course notes
Notes for MATH1903 Integral Calculus (Advanced)
School of Mathematics and Statistics, University of Sydney, 2009. Available from KOPYSTOP.

Reference book
James Stewart. *Calculus*. Brooks/Cole Publishing Company. ISBN 053459493. Available from the *CO-OP BOOKSHOP*.

Assessment
Your final raw mark for this unit will be calculated as follows:

70%: Exam at end of semester 2.
20%: Quiz mark.
10%: Assignment mark.

Your final raw mark is then scaled to produce your final mark. Marks are scaled so that the distribution of grades is consistent with the quality of the class, and the difficulty of the unit, as required by the University.

Examination
There is one examination of 1.5 hours' duration during the examination period at the end of semester 2. Further information about the exam will be made available at a later date.

Quizzes
There are two quizzes, each worth 10% of your final raw mark. Quizzes are held during tutorials, in

week 6 (beginning 31 August) and **week 11** (beginning 12 October).

You should put those dates in your diary now! You must sit for the quiz during the tutorial in which you are enrolled. Your quiz mark will not be recorded if you sit for the quiz in a tutorial in which you are not enrolled (unless you have made an arrangement with the Student Office). If you miss a quiz, then you must go to the Student Office as soon as possible afterwards.

Assignments
Two assignments will be set and marked. Each assignment is worth 5% of your final raw mark. Assignments will be due on **Tuesday 18 August** and **Tuesday 6 October**. Please see page 26 of the Junior Mathematics Handbook for details relating to the submission of assignments.

Any questions?
Before you contact us with any enquiry, please check the FAQ page:

`http://www.maths.usyd.edu.au/u/UG/JM/FAQ.html`

Where to go for help
For administrative matters, go to the **Mathematics Student Office, Carslaw room 520.**
For help with mathematics, see your lecturer, or your tutor. Your lecturer guarantees to be available during his indicated office hour, but may well be available at other times as well.

Week-by-week outline

Week	Topic	Contents
1	Riemann sums	Evaluation of Riemann sums. Definition of the Riemann integral.
2	Fundamental Theorem of Calculus	Fundamental Theorem of Calculus. Functions defined by integrals, logarithm. Area problems.
3	Applications of the integral	Volumes by slicing and shells. Lengths of curves. Integration by substitution (review).
4	Further applications Improper Integrals	Integrals of unbounded functions. Integrals over unbounded intervals. Integration by parts (review).
5	Convergence of Taylor Series	Review of sequences and series, especially Taylor Series and power series. Taylor's Theorem.
6	Applications of Taylor's Theorem.	Estimates of error terms. Numerical applications. Binomial series. Elementary functions.
7	Introduction to models and Differential Equations	Properties of models. Direction Fields. Visualisation of solution curves.
8	First Order DEs I	Classification of Differential Equations. Separable Equations. Partial Fractions.
9	First Order DEs II	Models, including growth and decay. Linear Equations.
10	Further examples and Models	Linear Equations (continued). Radioactive dating. Flow and mixing problems.
11	Second Order DEs	Second order homogeneous linear equations. Boundary conditions. Factorisation, equal roots case.
12	Systems of equations	Reduction to second order. Predator-prey systems. Simple harmonic motion, growing and damped oscillations, resonance.
13	Review	