

THE UNIVERSITY OF SYDNEY  
Semester 1, 2009

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Information Sheet for **MATH1001 Differential Calculus**

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### Web Site

It is important that you check the Junior Mathematics web site regularly. It may be found by following links from the University of Sydney front page, or from WebCT 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 MATH1001 page. On the MATH1001 page you will find on-line resources and other useful links. Announcements regarding assessment tasks will be made on this page at various times throughout the semester. Make sure you check the page weekly.

### Lectures

There are 3 different lecture streams. You should attend one stream (that is, two lectures per week), as shown on your personal timetable.

Times	Location	Lecturer	Consultation
8 am Thu & Fri	E Ave Aud	Weeks 1–6 Dr J Parkinson, Carlaw room 614 Weeks 7–13 A/Prof C Macaskill, Carlaw room 627	Tuesdays, 1-2pm Tuesdays, 1-2pm
11 am Thu & Fri	E Ave Aud	Ms J Henderson, Carlaw room 710	Fridays, 1-2pm
11 am Thu & Fri	Carlaw 157	Weeks 1–3 and 10–12 Ms T Morrison, Carlaw room 530 Weeks 4–9 and 13 Dr M Myerscough, Carlaw room 626	Thursdays, 1-2pm in Carlaw 351 Thursdays, 1-2pm

Lectures run for 13 weeks, and the last lecture will be on Friday 5 June.

### 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 cannot be recorded unless you attend the tutorial in which you are enrolled. Your attendance record will be taken into account in the event that you apply for special consideration at any stage.

### Tutorial sheets

The tutorial sheets are printed in the back of the course notes. **You should take your notes to your tutorial, since you will need to have the current week's sheet with you at your tutorial.**

Solutions to tutorial exercises for week  $n$  will usually be posted on the web by the afternoon of the Friday of week  $n$ .

## Assessment

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

- 65%: Exam at end of semester 1.
- 30%: Quiz mark.
- 5%: 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 1. Further information about the exam will be made available at a later date.

## Quizzes

Two quizzes will be held during tutorials, in the **weeks beginning 27 April and 25 May**. Each quiz is worth 15% of your final raw mark. 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.

## Assignments

One assignment will be marked, and will be worth 5% your final raw mark. The assignment will be due on **Thursday 26 March**. Please see page 26 of the Junior Mathematics Handbook for details relating to the submission of assignments.

Another set of assignment questions will be made available, but these will not be marked, and will not count towards your final mark. Solutions and a marking scheme will be provided, and you are encouraged to mark the questions yourself, or ask a friend to mark it for you (using the marking scheme provided). This will provide you with valuable feedback on how you are handling the material, and help you prepare for the exam.

## Course notes

*Lecture Notes for MATH1001 Differential Calculus*. School of Mathematics and Statistics, University of Sydney, Sydney, NSW, Australia.

Available from KOPYSTOP, 55 Mountain St Broadway.

See the Junior Mathematics Handbook for other references.

## Where to go for help

For administrative matters, go to the **Student Office, Carslaw room 520**.

For help with mathematics, see your lecturer, or your tutor. Lecturers guarantee to be available during their indicated office hour, but may well be available at other times as well.

If you are having difficulties with mathematics due to insufficient background, you should go to the Mathematics Learning Centre (Carlsaw room 455).

### Proposed week-by-week outline

Week	Topics
1	Set notation, the real number line. Complex numbers in cartesian form. Complex plane, modulus.
2	Complex numbers in polar form. De Moivre's Theorem. Complex powers and $n$ th roots.
3	Definition of $e^{i\theta}$ and $e^z$ for $z$ complex. Applications to trigonometry. Revision of domain and range of a function.
4	Working in $\mathbb{R}^3$ . Curves and surfaces. Functions of 2 variables. Level curves.
5	Partial derivatives and tangent planes. The derivative as a difference quotient. Geometric significance of the derivative. Discussion of limit.
6	Higher order partial derivatives. Limits of $f(x, y)$ . Continuity.
7	Maxima and minima of $f(x, y)$ .
8	The chain rule. Implicit differentiation.
9	Directional derivatives and the gradient.
10	Limit laws, l'Hôpital's rule, composition law. Definition of sinh and cosh and their inverses.
11	Taylor polynomials. The remainder term.
12	Taylor series.
13	Revision.