

THE UNIVERSITY OF SYDNEY
Summer School, 2011

Information Sheet for **MATH1001 Differential Calculus**

Web Site

It is important that you check the Summer School web site regularly. It may be found by following links from the University of Sydney front page, or by going directly to

<http://www.maths.usyd.edu.au/u/UG/SS/SS1001/>

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. Make sure you check the page weekly.

Lectures

There is only 1 lecture stream (that is, two 2-hour lectures per week), as shown on your personal timetable.

Times	Location	Lecturer	Consultation
10am (Wks 1-2) Mon & Tue	Carslaw 373	Dr N Saunders Carslaw room 807	Tue, 2-3pm (Wk 2) in Carslaw 707A
10am (Wks 3-6) Mon & Tue	Carslaw 373	Mr W Tong Carslaw room 482	Tue, 2-3pm (Wks 3-6) in Carslaw 482

Lectures run for 6 weeks. The last lecture will therefore be on Tuesday 14th February.

Tutorials

Tutorials (one per lecture) start in week 1. 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 lecture's sheet with you at your tutorial.** The tutorial sheets for a given lecture will also be available on the MATH1001 web page.

Solutions to tutorial exercises for tutorial n will be posted on the web on the afternoon of tutorial n .

Assessment

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

65%: Exam at end of semester 1.

15%: Assignment mark.

20%: Quiz mark.

Your assignment and quiz mark will be better marked against your exam 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 lectures, on **Tuesday week 3 (24th January)** and **Tuesday week 5 (7th February)**. Each quiz is worth 10% of your final raw mark. **If you are unable to attend those particular lectures, you must notify the lecturer well in advance.**

Assignments

Three short assignments will be set and will be handed out during lectures. Copies will also be posted on the web site. Assignments count for 15% (5% each) towards your final mark. Solutions will be provided when the assignments are returned. Assignments are to be submitted in the tutorials where students are allocated.

Assignment 1 will be handed out Monday week 1, 19th January and will be **due Monday week 2 (16th January)**.

Assignment 2 will be handed out Monday week 3, 23rd January and will be **due Monday week 4 (30th January)**.

Assignment 3 will be handed out Monday week 5, 6th February and will be **due Monday week 6 (13th February)**.

Course notes

Britton, Mathas and Myerscough. *MATH1001 Differential Calculus*. School of Mathematics and Statistics, University of Sydney, Sydney, NSW, Australia.

Available from KOPYSTOP, 55 Mountain St Broadway after the 10th January.

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.

Lecture-by-lecture outline

Lecture	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 and revision.