THE UNIVERSITY OF SYDNEY
Semester 1, 2017

Information Sheet for **MATH1011 Applications of Calculus**

Websites: It is important that you check both the Junior Mathematics website and the MATH1011 website regularly.

Junior Mathematics webpage: `http://www.maths.usyd.edu.au/u/UG/JM/`
MATH1011 webpage: `http://www.maths.usyd.edu.au/u/UG/JM/MATH1011`

Both sites may be accessed through the Learning Management System (Blackboard):

`https://elearning.sydney.edu.au`.

Important announcements relating to Junior Mathematics are posted on the Junior Mathematics page. On the MATH1011 page you will find online resources and other useful links. Announcements regarding assessment tasks will be made on this page at various times throughout the semester.

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

Times	**Location**	**Lecturer**
8 am Thu & Fri	Eastern Avenue Auditorium	George Papadopoulos
11 am Thu 11 am Fri	Footbridge LT New Law LT 101	Jo Bellanca

Lectures run for 13 weeks. The first lecture will be on Thursday 9 March. The last lecture will be on Friday 9 June.

Consultation times: Consultation times will be posted on the MATH1011 webpage.

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 and exercise sheets: The question sheets for a given week will be available on the MATH1011 webpage. 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: *Applications of Calculus (Course Notes for MATH1011)* are available for purchase from Kopystop, 55 Mountain St, Broadway. See the Junior Mathematics Handbook for other useful references.

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

65%:	Exam at end of Semester 1.
15%:	Quiz 1 mark (using the better mark principle).
15%:	Quiz 2 mark (using the better mark principle).
2.5%:	Assignment 1 mark.
2.5%:	Assignment 2 mark.

The *better mark principle* means that for each quiz, the quiz counts if and only if it is better than or equal to your exam mark. If your quiz mark is less than your exam mark, the exam mark will be used for that portion of your assessment instead. For example, if your quiz 1 mark is better than your exam mark while your quiz 2 mark is worse than your exam mark, then the exam will count for 80%, quiz 1 will count for 15%, and the assignments will count for 5% of your overall mark. The assignment marks count for 5% regardless of whether they are better than your exam mark or not.

Final grades are returned within one of the following bands:

High Distinction (HD), 85–100: representing complete or close to complete mastery of the material; **Distinction (D), 75–84:** representing excellence, but substantially less than complete mastery; **Credit (CR), 65–74:** representing a creditable performance that goes beyond routine knowledge and understanding, but less than excellence; **Pass (P), 50–64:** representing at least routine knowledge and understanding over a spectrum of topics and important ideas and concepts in the course.

A student with a passing or higher grade should be well prepared to undertake further studies in mathematics which are dependent on this unit of study. A student achieving a distinction or higher grade should consider enrolling in advanced units in second semester.

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 on the website.

Quizzes: Quizzes will be held during tutorials. You must sit for the quiz during the tutorial in which you are enrolled, unless you have a Permission Slip from the Student Services Office, issued only for verifiable reasons. Otherwise, your quiz mark may not be recorded.

Assignments: There are two assignments, which must be submitted electronically, **as PDF files only**, in Turnitin (an internet-based plagiarism-prevention service), via the Learning Management System (Blackboard) website by the deadline. Note that your assignment will not be marked if it is illegible or if it is submitted sideways or upside down. It is your responsibility to check that your assignment has been submitted correctly.

Assessment and feedback schedule:

Task	**Available**	**Deadline/date**	**Latest extension***	**Feedback**
Assignment 1	Mon 13 Mar	11:59 pm Thu 23 Mar	11:59 pm Thu 30 Mar	9 am Mon 3 Apr
Quiz 1		10–12 Apr (Week 6)		24 & 26 Apr, 2 May (Weeks 7–8)
Assignment 2	Mon 1 May	11:59 pm Thu 11 May	11:59 pm Thu 18 May	9 am Mon 22 May
Quiz 2		29–31 May (Week 12)		5–7 Jun (Week 13)

* Extensions for assignments are only possible for students registered with Disability Services or applying for Special Consideration or Special Arrangements.

Special consideration and special arrangements: While studying at the University of Sydney, you may need to apply for special consideration or special arrangements as follows:

> Special consideration may be granted to students where well-attested illness, injury, or misadventure occurs to them (or someone they have carer's responsibility for) during the semester or the exam period. Special arrangements may be granted for essential community commitments. Further information on eligibility, document requirements, and how to apply is available at `http://sydney.edu.au/science/cstudent/ug/forms.shtml#special_consideration`. Applications must be made using the University's formal application process.
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> Final examinations will be held in the formal examination period. Students affected by illness, injury or misadventure may lodge a request for Special Consideration to sit a replacement examination in the formal Replacement Examination period (week 18).
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> If you are registered with Disability Services and would like to have adjustments applied to the replacement examination, you are required to amend your Academic Plan with Disability Services specifically for this replacement examination. This needs to be done as soon as you are notified of award of the replacement opportunity. If you have not done so, you will be allowed to sit the replacement, but under unadjusted conditions.

You should *not* submit an application of either type

- if you are absent from a tutorial and there is no assessment associated with the missed tutorial, or
- if you miss a quiz, since the better mark principle applies.

The assessment category for the assignments is "Submitted Work".

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 *Student Services Office, Carslaw 520*. For help with mathematics, see your lecturer, your tutor, a duty tutor, or use the Ed discussion forum (`https://edstem.com.au`). Lecturers guarantee to be available during their indicated office hours, but may be available at other times as well. If you are having difficulties with mathematics due to insufficient background, you may seek help from the *Mathematics Learning Centre, Carslaw 177*. You may also email questions about the subject to `MATH1011@maths.usyd.edu.au`. Ensure that any emails that you send to this address contain your name and SID, because anonymous emails will be ignored.

Objectives: This unit aims to illustrate:

- how experimental data, such as that obtained in the life sciences, can be explained by means of elementary functions;
- how differential and integral calculus can be used to solve problems found in the life sciences;
- the development of an interesting area of mathematics.

Outcomes: Students who successfully complete this unit should be able to:

- analyse practical problems using techniques from differential and integral calculus;
- fit as appropriate a linear, exponential or a periodic function to a set of experimental data;
- sketch the generalised sinusoidal functions;
- use differential calculus to solve optimisation problems in one independent variable;
- calculate the partial derivatives of functions of two variables, and hence to solve optimisation problems in two independent variables;
- calculate finite sums and use the sigma notation where appropriate;
- evaluate definite integrals and use definite integrals in applications;
- determine when improper integrals of infinite type exist.

Proposed week-by-week outline:

Week	Topics
1	Sine and cosine functions.
2	Logarithms and the exponential function.
3	Scaling data: log-log and semi-log transformations.
4	Applications of differentiation. (Optimisation, curve sketching.)
5	Applications of differentiation. (Optimisation, curve sketching.)
6	Coordinate geometry in 3 dimensions. Functions of two variables.
7	Partial derivatives.
8	Maxima and minima of functions of two variables.
9	Finite sums and the definite integral.
10	Integration techniques.
11	Applications of integration.
12	Improper integrals.
13	Revision.