THE UNIVERSITY OF SYDNEY
Semester 2, 2017

Information Sheet for **MATH1005 Statistics**

Websites: It is important that you check both the Junior Mathematics website and the MATH1005 website regularly.

Junior Mathematics webpage: `http://www.maths.usyd.edu.au/u/UG/JM/`
MATH1005 webpage: `http://www.maths.usyd.edu.au/u/UG/JM/MATH1005`

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 MATH1005 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 five different lecture streams. You should attend one stream (that is, two lectures per week), as shown on your personal timetable.

Times	Location	Lecturer	Office
8am Mon & Tue	Eastern Ave Aud	Di Warren	Carslaw 527
11am Mon & Tue	Eastern Ave Aud	Di Warren	Carslaw 527
1pm Mon & Tue	Eastern Ave Aud	Ray Kawai	Carslaw 816
1pm Mon 10am Tue	Messel LT4002 (SNH) Chemistry LT1	Sarah Romanes/Kevin Wang	
9am Mon 12pm Tue	ABS LT1110 Merewether LT1	Winarsih Suhana/Wen Dai	

Lectures run for 13 weeks. The first lecture will be on Monday 31 July. The last lecture will be on Tuesday 31 October.

Consultation times: Consultation times will be posted on the MATH1005 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 MATH1005 webpage. Solutions to tutorial exercises for week n will usually be posted on the web by the afternoon of the Friday of week n.

Reference book: The following E-Text ($50) is not compulsory, but is helpful extra reading. David Freedman, Robert Pisani and Roger Purves. *Statistics*. Norton, 2007. ISBN: 978-0-393-52210-5.

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

65%: Exam at end of Semester 2.
5%: Quiz 1 mark (using the better mark principle).
5%: Quiz 2 mark (using the better mark principle).
5%: Quiz 3 mark (using the better mark principle).
10%: Assignment 1 mark.
5%: Assignment 2 mark.
5%: Assignment 3 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 and quiz 3 marks are worse than your exam mark, then the exam will count for 75%, quiz 1 will count for 5%, and the assignments will count for 20% of your overall mark. The assignment marks count for 20% 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.

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 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 three 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 (check that you can view each page).

Assessment and feedback schedule:

Task	Available	Deadline/date	Latest extension*	Feedback
Assignment 1	Fri 11 Aug	6am Mon 21 Aug	6am Mon 28 Aug	9am Mon 28 Aug
Quiz 1		28 Aug–1 Sep (Week 5)		4–8 Sep (Week 6)
Assignment 2	Fri 8 Sep	6am Mon 18 Sep	6am Mon 25 Sep	9am Mon 25 Sep
Quiz 2		9–13 Oct (Week 10)		16–20 Oct (Week 11)
Assignment 3	Fri 13 Oct	6am Mon 23 Oct	6am Mon 30 Oct	9am Mon 30 Oct
Quiz 3		30 Oct–3 Nov (Week 13)		Study Vacation

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

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/students/special-consideration-and-arrangements.html`. Applications must be made using the University's formal online 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.
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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".

If you are granted a "mark adjustment" for a quiz or an assignment, any marks obtained will not count and the weighting will be added to the examination weighting.

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 `MATH1005@sydney.edu.au`. Ensure that any emails that you send to this address contain your name and SID, because anonymous emails will be ignored.

Objectives: The objectives of this unit are to:

- introduce techniques for summarising experimental univariate and bivariate data, such as that obtained in various branches of science, medicine, commerce etc, by means of elementary statistics and diagrams;
- use probability theory to provide a mathematical framework for real life data modelling;
- introduce statistical inference and show how statistical tests can provide evidence for or against a given scientific hypothesis.

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

- explain univariate and bivariate data by means of the five number summary, mean, variance and standard deviation, correlation coefficient, boxplot, histogram and scatterplot;
- find the least squares regression line as a way of describing a linear relationship in bivariate data;
- use methods derived from the three axioms of probability to calculate the probabilities of simple events;
- understand the concept of a random variable and the meaning of the expected value and variance;
- apply the Binomial distribution as a model for discrete data;
- use the Normal distribution as a model for continuous data;
- understand the central limit theorem;
- understand the concept of hypotheses tests and p-values for finding evidence for or against simple null hypotheses; in particular using the binomial test for testing proportions, one- or two-sided Z-, t- or sign-test for making inferences about the population mean;
- understand the concept of a confidence interval;
- use the chi-squared test for simple goodness-of-fit problems;
- use the R statistical computing environment to obtain numerical and graphical summaries of data, and for performing various statistical calculations.

Proposed week-by-week outline:

Week	Topics
	PART 1: EXPLORATORY DATA ANALYSIS
1	Topic 1: Data and Graphical Summaries
2	Topic 2: Numerical Summaries
3	Topic 3: Bivariate Data
	PART 2: PROBABILITY THEORY AND DISTRIBUTION THEORY
4	Topic 4: Probability, Random Variables, and Distributions
5	Topic 5: Discrete Random Variables
6	Topic 6: Continuous Random Variables
7	Topic 7: Combinations of Random Variables
	PART 3: HYPOTHESIS TESTING
8	Topic 8: Hypothesis Testing
Break	
9	Topic 9: Tests for Proportion
10	Topic 10: Tests for Means
11	Topic 11: Test for Goodness of Fit
12	Topic 12: Confidence Intervals
13	Revision