
Information Sheet for **MATH1005 Statistics**

Web Site

It is important that you regularly check both the Junior Mathematics web site

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

and the MATH1005 web site

<http://www.maths.usyd.edu.au/u/UG/JM/MATH1005>

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
8 am Mon & Tue	E Ave Aud	Dr D Warren, Carslaw room 527
11 am Mon & Tue	E Ave Aud	Weeks 1-2: Dr D Warren, Carslaw room 527 Weeks 3-13: A/Prof S Peiris, Carslaw room 819
11 am Mon & Tue	Wallace	Dr M Stewart, Carslaw room 818

Lectures run for 13 weeks. The last lecture will therefore be on Tuesday 25 October.

Consultation times

Lecturers are available for consultation as follows:

- Mondays 1 - 2pm in Carslaw 818
- Wednesdays 1 - 2pm in Carslaw 819

Duty tutors will also be available. Check 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 sheets

The tutorial sheets for a given week will be available by the Friday of the previous week. **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 .

Assessment

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

- 65%: Exam at end of semester 2.
- 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 2. Further information about the exam will be made available at a later date.

Quizzes

There are two quizzes, each worth 15% of your final raw mark. Quizzes are held during tutorials, in **week 8** (beginning 12 September) and **week 12** (beginning 17 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 Mathematics Student Office). If you miss a quiz, then you must go to the Mathematics Student Office as soon as possible afterwards.

Assignments

One assignment will be marked, and will be worth 5% of your final raw mark. The assignment will be due on **Thursday 1 September**. Please see page 26 of the Junior Mathematics Handbook for details relating to the submission of assignments.

Text book

M C Phipps and M P Quine. *A Primer of Statistics*. Prentice Hall, Sydney, NSW, Australia, (fourth edition) 2001.

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 statistics, see your lecturer, your tutor or a duty 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 statistics due to insufficient background, you should go to the Mathematics Learning Centre (Carlsaw room 441).

Objectives

This unit aims:

- 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;
- to use probability theory to provide a mathematical framework for real life data modelling;
- to introduce statistical inference and show how statistical tests can provide evidence for or against a scientific question.

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 inference 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.

Week-by-week outline

Week	Topics	Pages
1	Introduction. Type of data. Histograms. Rounding down/off. Stem-leaf displays.	1- 8 8-12
2	5-number summaries. Boxplots. Distribution shapes. Revision of summation notation. Summary statistics (mean and sd).	13-19 20-24
3	Computer summaries. Correlation. Linear regression. Computer output. Residual plots.	25-27 28-32
4	Classical probability. Counting. Sampling without replacement. Rel freq. Mut. excl. and indep. events. Probability rules.	43-47 47-51
5	Integer-valued rv's. Binomial. Binomial tables. Mean.	56-57 58-59
6	Expectation. Mean and variance. Discussion of cts rvs. Normal rvs and use of tables.	60-61 66-68
7	More on the normal. The Central Limit Theorem.	70-73 73-75
8	Normal approximation to the Binomial. Notion of sampling distributions. Hypothesis testing. P-values.	75-77 84-87
9	Tests for proportions. Sign tests.	88-91 91-93
—————M-I-D-S-E-M-E-S-T-E-R—B-R-E-A-K—————		
10	More on P-values. Z-test.	96-97
11	<i>t</i> - tables and one sample <i>t</i> -tests. Paired <i>t</i> -test. Paired sign test (revision).	98-99 100
12	Two sample <i>t</i> -tests. Discussion of comparative studies. Confidence intervals (μ).	101-102 103-105
13	Confidence intervals (p). Further topics (e.g. Chi-squared tests.). Revision.	105

Tutorials commence in week 2

It is recommended that you bring the textbook “A Primer of Statistics” to both tutorials and lectures.