Division of Economic and Financial Studies

STAT170 – Introductory Statistics

First Semester 2007 – X1

Unit Outline

Unit Convenor: Linda Owens

Students in this unit should read the unit outline carefully at the beginning of semester. It contains important information about the unit. If anything in it is unclear, please consult the unit convenor.

About this unit

Stat170 is a three credit point unit offered by the Statistics Department in the Division of Economic and Financial Studies. It can be taken either day or evening in either semester, or as a full year unit. It may also be taken through the Centre for Open Education. There are neither prerequisites nor corequisites for this unit.

Stat170 is a prerequisite for all 200 and 300 level statistics units and will be the first statistics unit taken by students intending to major in Statistics. It is also a requirement for many other areas of study and, as such, is a core unit for a number of courses at Macquarie University.

Stat170 provides a broad introduction to statistical practice and data analysis techniques. It aims to equip students with a basic understanding of statistics, such that they are able to employ appropriate methods of analysis in various circumstances. The techniques learnt are widely used in the sciences, social sciences, business areas and many other fields of study. Topics covered include study design, data manipulation, statistical inference, regression and analysis of categorical data.

Teaching Staff

Linda Owens: Tel: 9850 8559   email: lowens@efs.mq.edu.au

Consultation times for teaching staff will be advised at the beginning of the semester and will be available on WebCT.

Please note that any email communication with staff must be conducted using your *University email address only*.

The Don McNeil Prize for Introductory Statistics

This prize is named in honour of the foundation Professor of Statistics who has had an enormous impact on the teaching of first year statistics at Macquarie University. The prize is $1000 and is available to any student enrolled in Introductory Statistics.

The prize will be awarded each semester to the student with the best overall performance in the unit.

Text books and other reference material

Students will need to purchase from the Co-op Bookshop, a copy of:
- Stat170 Introductory Statistics Study Guide (includes a compact disc)
- Modern Statistics: A Graphical Introduction by McNeil et al   (Call number QA276.M22)

A calculator with statistical mode is essential.

Suggested additional material:

The following texts are recommended reading:

- Statistics without Tears by Rowntree (Penguin)
- The Basic Practice of Statistics by Moore (W.H. Freeman, 2000)
- Mind on Statistics by Utts & Heckard (Duxbury, 2002)
- Just the Essentials of Elementary Statistics by Johnson & Kirby (Thomson, 2003)
- Statistics for the Life Sciences by Samuels & Witmer (Prentice Hall, 2003)
- Statistics: Informed Decisions Using Data by Sullivan (Prentice Hall, 2004)
- Intro Stats by De Veaux, Velleman and Bock (Pearson, 2006)

Unit web pages

Information relating to Stat170 can be found by visiting the Macquarie University Statistics Department web site. The URL for this site is:

http://www.stat.mq.edu.au

1. From this site you can access the Stat170 Home page by selecting **Undergraduate** then selecting **Units** then selecting **Stat170**. General information relating to Stat170 is available here together with a link to WebCT.

2. Alternatively, the URL to access WebCT directly is:

http://online.mq.edu.au

Use the Chat Room on WebCT to communicate with other students and the convenor.

Learning outcomes

By the end of this unit students should be able to:

★ organise and summarise data graphically and numerically

★ analyse data using appropriate techniques

★ draw conclusions from the results of data analysis

Generic Skills

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop students' generic skills in a range of areas. One of the aims of this unit is for students to develop their skills in the following:

★ manipulating and analysing data using Excel and the statistical package EcStat

★ enhancing their problem solving ability

★ improving their written communication skills, particularly report writing skills

★ confidence in the use of the Internet for obtaining information and communicating with others in Online Discussions

★ improving their ability to work co-operatively as a team member.

Teaching and Learning Strategy

Lectures
You should begin Lectures in Week 1 and should work through one lecture in each week of the semester.

Tutorials
You should begin Tutorials in Week 2. The aim of these is to practise techniques learnt in lectures with each tutorial being based on material from the previous lecture.

Practicals
You should begin Practicals in Week 2. Each practical session is based on work from the previous week's lecture. During these sessions you will use the statistical computer package EcStat and the techniques learnt during lectures to help solve statistical problems.

Assessment

COURSEWORK

Assignments	10%
GNATS	10%
WASPS	<u>10%</u>
	30%

EXAMINATIONS

Class Test	10%	(or not counted)
Practical Test	10%	(or not counted)
Final Examination	<u>50%</u>	(or 60% if only one test counted or 70% if neither test counted)
	70%	

> If you gain **less than 15** marks in the coursework, the highest grade you can receive is a **P**.
> If you gain **less than 10** marks in the coursework, the highest grade you can receive is a **PC**.

General Network Assessed Tests (GNATs)   10 marks

Nine General Network Assessed Tests (GNATs) should be completed in your own time on any PC that is connected to the Internet. This material is designed to give you an opportunity to practise the mechanical aspects of statistics. GNAT7 is designed for revision and is worth 2 marks. All other tests are worth 1 mark. You are allowed two attempts at each GNAT and the higher of the two marks will be recorded. To determine which browsers are supported by WebCT go to:

http://online.mq.edu.au/uw/software.html.

Please note that other important information regarding GNATs is outlined in the GNATs document (green) in the Stat170 Study Guide.

Web Assessment Using a Statistical Package (WASPs)   10 marks

In practical sessions you will use the beige worksheets provided in the Study Guide package. These have spaces to write your answers to the questions and exercises. These answers need to be transferred to WASPs on the Internet and will be assessed there. Each of these tests is worth 1 mark. Questions should be answered carefully as there is only one attempt allowed at each WASP. Information on how to access WASPs is given in Practical 0.

Assignments   10 marks

There are three assignments which are worth 3%, 3% and 4% respectively. They should be submitted by the due time and date on the answer sheets provided. They give you an opportunity to develop good statistical practice and to reinforce and apply the concepts covered in lectures and the skills learned in practical sessions. Information relating to penalties is shown on the front cover of the assignments.

Class tests and examination

External students have the option of taking the class test and the practical test. The class test will be held in Week 10 and will cover all material up to and including Lecture 8. The practical test will be held in Week 13 and will cover all material in the unit. Both tests must be undertaken at the University. Information regarding attendance will be available by Week 6. Students will be permitted to take one A4 sheet, handwritten on both sides, into the final examination but these will not be allowed in either the class test or the practical test. Text-returnable calculators are not permitted in either of the tests or the final examination. Statistical tables and a page of formulae will be attached to the class test and the final examination. Note that your mark for this section of the unit will be calculated as the best of i) both tests (20%) plus the examination (50%) OR ii) only one test (10%) plus the examination (60%) OR iii) the examination only, in which case the examination is worth 70%.

Students MUST perform satisfactorily in the final examination in order to pass the unit regardless of their performance throughout the semester.

Students should note that, if they fail the final examination, their coursework will not count and the SNG allocated will be their final examination mark.

The University Examination period in First Half Year 2007 is from 13th – 29th June. You are expected to present yourself for examination at the place specified by the Centre for Open Education. The date and time of the examination can be found in the University Examination Timetable. This timetable will be available in draft form approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations.

http://www.timetables.mq.edu.au/exam

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at

http://www.reg.mq.edu.au/Forms/APSCons.pdf

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period.

Note that there is a Division policy regarding requests for special consideration for examinations and the granting of supplementary examinations. This can be found at:

http://www.efs.mq.edu.au/student_support/important_processes/special_consideration

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period.

Plagiarism

The University defines plagiarism in its rules: "Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the *Handbook of Undergraduate Studies* or on the web at:

http://www.student.mq.edu.au/plagiarism/

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

University Policy on Grading

Academic Senate has a set of guidelines on the distribution of grades across the range from Fail to High Distinction. Your final result will include one of these grades plus a standardised numerical grade (SNG). Your raw mark for a unit (ie. the total of your marks for each assessment item, including the final examination) may not be the same as the SNG which you receive. Under the Senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performances of their students should achieve similar results.

It is important that you realise that the policy does not require that a minimum number of students are to be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain their actions if more than 20% of students fail in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark than another will also receive a higher final scaled mark.
For an explanation of the policy see:

http://www.mq.edu.au/senate/issues.html

then select   GUIDELINES FOR GRADING – Brief Explanation
GUIDELINES FOR GRADING - Detailed Explanation

Your final grade in Stat170 will be based on your work during semester and in the final examination as specified in the Assessment section above. The grades allocated are as set out in the Bachelor Degree Rules 10(2) as follows:

HD   High Distinction   denotes performance which meets all unit objectives in such an exceptional way and with such marked excellence that it deserves the highest level of recognition

D   Distinction   denotes performance which clearly deserves a very high level of recognition as an excellent achievement in the unit

Cr   Credit   denotes performance which is substantially better than would normally be expected of competent students in the unit

P   Pass   denotes performance which satisfies unit objectives

PC   Conceded Pass   denotes performance which meets unit objectives only marginally

F   Fail   denotes performance which does not meet unit objectives

Student Support Services

Macquarie University provides a range of Academic Student Support Services. Details of these services can accessed at

http://www.student.mq.edu.au

Extra help is available for students enrolled in Stat170. Students can seek help from the following sources at various times when they think it may be beneficial to them:

Staff office hours: Most members of the Statistics Department have office hours each week when they are available to help students enrolled in Introductory Statistics. A list of these consultation times will be available on the Web. Contact with staff during office hours may be in person or by telephone. Statistics staff is located on the 5th floor of E4A.

Numeracy Centre: The Numeracy Centre was set up to help students having difficulties with numeracy based subjects. Any student who lacks the knowledge of mathematics needed for Stat170 is encouraged to seek the help of the Centre. It offers a number of services including individual help, supplementary workshops which are run each week and an opportunity to meet with other students to discuss problems. Students enrolled in the external offering may utilise the facilities and services provided by the Centre which is located in C5A225. The URL is

http:www.maths.mq.edu.au/numeracy

CDRom: The CDRom has a Learning package which includes lectures, quizzes and examples. The CDRom lecture material includes different examples to those presented in lectures and thus gives you a further opportunity to work through the material. The quizzes and examples accompanying these help to test and reinforce your knowledge of the material covered.

Computing Laboratories
The Excel Add-in, EcStat, which is included on the CDRom and in the computing labs in E4B will be used in practical sessions and for assignments. Assignments, GNATs and WASPs can be completed in these rooms, which are available to external students. You will need to bring a memory stick when using these computers. GNATs and WASPs can be completed on any PC that has access to the Internet.

Opening hours of computing laboratories during semester:

Mon-Fri   8am - 10pm   Sat-Sun   9am - 5pm

For opening hours during semester breaks see notices outside the rooms. Look for additional information on the whiteboards in the labs. Please note that computing labs may be booked for classes. Check the timetable on the door of the lab to make sure that the room is free.

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UNIT SCHEDULE

WEEK	LECTURE TOPIC	TEXT Chapter	Assessment Due (*Note that all Gnats and Wasps are due by 10pm)*
26 February W1	Introduction Study Design Simple Displays	1, 2	Obtain Study Guide and Text Book from Bookshop.
5 March W2	Graphical Displays of continuous data	2	DEMO GNAT: 5/3 – 8/6 DEMO WASP: 5/3 – 8/6
12 March W3	Numerical Summaries & Distributions	3, 4	GNAT 1: 12/3 – 25/3 WASP 1: 12/3 – 23/3
19 March W4	Normal Distribution	4	GNAT 2: 19/3 – 1/4 WASP 2: 19/3 – 30/3
26 March W5	Distribution of Means and Proportions	5	GNAT 3: 26/3 – 8/4 WASP 3: 26/3 – 6/4
2 April W6	Confidence Intervals **Public Holiday Friday**	6	GNAT 4: 2/4 – 29/4 WASP 4: 2/4 – 27/4 **Assignment 1 due**
SEMESTER BREAK: 9 April – 22 April			
23 April W7	Hypothesis Tests **Public Holiday Wednesday**	7	GNAT 5: 23/4 – 6/5 WASP 5: 23/4 – 4/5
30 April W8	Comparisons: Two-sample Tests	8	GNAT 6: 30/4 – 13/5 GNAT 7: 30/4 – 20/5 WASP 6: 30/4 – 11/5
7 May W9	Examining Relations	9	WASP 7: 7/5 – 20/5 **Assignment 2 due**
14 May W10	Testing and Assessing Relations	9	GNAT 8: 14/5 – 27/5 WASP 8: 14/5 – 25/5 **CLASS TEST**
21 May W11	Categorical Data Analysis Hypothesis Tests	10	GNAT 9: 21/5 – 3/6 WASP 9: 21/5 – 1/6
28 May W12	Categorical Data Analysis Odds ratios	10	WASP 10: 28/5 – 8/6 **Assignment 3 due**
4 June W13	Unit summary		

After completing a quiz you must View Results in order that your quiz is graded. If any of your quizzes appears as UNGRADED *then you should select View Scores for Quizzes from the Gnats and Wasps page and press Go. Click on the attempt that has not been graded and when you return to Scores your quiz will have been graded.*

Due dates for Gnats and Wasps: Note that you have at least 11 days to complete each quiz. You should complete these early, particularly your first attempt at each Gnat. If left until the last day then you may find that you have access problems and will lose the marks for that quiz. You should note that the cut-off dates on WebCT are two days later than the due dates listed above. This is to allow for any problems which may arise with WebCT. However, you should attempt all quizzes before the due dates.