Division of Economic and Financial Studies

STAT170 – Introductory Statistics

Summer Offering 2007

Unit Outline

Unit Convener: Jenny Middledorp

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

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 day or evening in either semester, externally in first semester, or as a full year unit. There are no prerequisites or 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

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Classes

Classes will be held on Mondays, Wednesdays and Fridays beginning Wednesday 3rd January 2007. There will also be a class on Thursday 25th January replacing Friday 26th January which is a public holiday. Computer practicals can be completed when the laboratories in E4B are open. It is suggested that students attempt their practical in the afternoon following the relevant lecture. Please see the Unit Schedule on Page 6 for times and dates of all classes.

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:

<div align="center">

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

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Alternatively, the URL to access WebCT directly is:

<div align="center">

http://online.mq.edu.au

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

Teaching and Learning strategy

Lectures
Lectures begin on Wednesday 3 January. Students should attend ONE 2-hour session per day from 9.00am – 11.00am. The Study Guides package should be brought to each lecture as it contains copies of the lecture slides.

Tutorials
Tutorials also begin on Wednesday 3 January and are based on work from the morning's lecture. The aim of tutorials is to practise techniques learnt in lectures. Tutorials are designed for students to work together in groups. The emphasis on group work is to explore ideas, devise and ask questions, and plan ways to answer them. We believe that working within a group framework will be beneficial for the educational and personal development of students.

Practicals
Practicals also begin on Wednesday 3 January. Each practical session is based on work from the morning's lecture. During these sessions you will use the statistical computer package EcStat and the techniques learnt during lectures to help solve statistical problems.

Text books and other reference materials

Students will need to purchase, from the Co-op Bookshop, a copy of:

- Stat170 Introductory Statistics Study Guides (includes a compact disc)
- Modern Statistics: A Graphical Introduction by McNeil et al   QA276.M22

A calculator with statistical mode is essential and should be brought to all classes.

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, 2004)
- 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)

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

Assessment

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        COURSEWORK
            Assignments         15%
            GNATS               10%
            WASPS                5%
                                30%
        EXAMINATIONS
            Class Test          15%   (or not counted)
            Final Examination   55%   (or 70% if Class Test not counted)
                                70%
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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%. All other tests are worth 1%. You are allowed two attempts at each GNAT and the higher mark of the two will be recorded.

There is an icon on WebCT which enables you to access Statquiz which contains the Gnats quizzes and is located on a different server. Your username here is your Student ID and your initial password is also your Student ID. You should change your password when you login.

Web Assessment Using a Statistical Package (WASPs)   **5 marks**

In practical sessions you will use the beige worksheets provided in the Study Guides 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 ½%. 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   **15 marks**

There are three assignments, which should be submitted at the beginning of the lectures on the due dates. There will be penalties applied if assignments are submitted late, ie. after 9am. Assignments are to be submitted 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. Assignments can be submitted as a group, where a group can consist of up to three students. It is important that each member of the group contributes equally to the assignment. More information will be given in tutorial classes. Marks allocated to that assignment will be awarded to each student in the group. Please see the front cover of the assignment for information on penalties.

Class test and examination

The class test will be held in your tutorial on Monday 22 January. It will cover all material up to and including Lecture 8.

The final examination will be held on Wednesday 7th February at 9.20am.

Text-returnable calculators are not permitted in the class test or the final examination. A page of formulae will be attached to the class test and the final examination. Students will be permitted to take one A4 sheet, handwritten on both sides, into the final examination.

Note that your mark for this section of the unit will be calculated as the better of either your class test (15%) plus the examination (55%) OR as 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 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

<div align="center">http://www.reg.mq.edu.au/Forms/APSCons.pdf</div>

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled at a later date.

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

<div align="center">http://www.efs.mq.edu.au/student_support/important_processes/special_consideration</div>

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:

<div align="center">

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

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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:

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http://www.mq.edu.au/senate/MQUonly/Issues/Guidelines2003.doc or

http://www.mq.edu.au/senate/MQUonly/Issues/detailedguidelines.doc

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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.

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. GNATs and WASPs can be completed on any PC that has access to the Internet.

Opening hours of computing laboratories:

2pm - 5pm   Monday, Wednesday, Friday

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UNIT SCHEDULE

DAY	LECTURE TOPIC	Tutorial	TEXT Chapter	Assessment Due (*Note that all Gnats and Wasps are due by 10pm*)
Wed 3 Jan Lecture 1	Introduction Study Design Simple Displays	2	1, 2	Obtain Study Guides and Text Book from Bookshop. DEMO GNAT: 3/1 – 7/2 DEMO WASP: 3/1 – 7/2
Fri 5 Jan Lecture 2	Graphical Displays of continuous data	3	2	
Mon 8 Jan Lecture 3	Numerical Summaries & Distributions	4	3, 4	GNAT 1: 8/1 – 11/1 WASP 1: 8/1 – 11/1
Wed 10 Jan Lecture 4	Normal Distribution	5	4	GNAT 2: 10/1 – 14/1 WASP 2: 10/1 – 14/1
Fri 12 Jan Lecture 5	Sampling	6	5	GNAT 3: 12/1 – 15/1 WASP 3: 12/1 – 15/1
Mon 15 Jan Lecture 6	Confidence Intervals	7	6	GNAT 4: 15/1 – 18/1 WASP 4: 15/1 – 18/1 **Assignment 1 due**
Wed 17 Jan Lecture 7	Hypothesis Tests	8	7	GNAT 5: 17/1 – 21/1 WASP 5: 17/1 – 21/1
Fri 19 Jan Lecture 8	Comparisons: Two-sample Tests	9	8	GNAT 6: 19/1 – 23/1 GNAT 7: 19/1 – 26/1 WASP 6: 19/1 – 23/1
Mon 22 Jan Lecture 9	Examining Relations	**Class Test**	9	WASP 7: 22/1 – 25/1 **Assignment 2 due**
Wed 24 Jan Lecture 10	Testing and Assessing Relations	11	9	GNAT 8: 24/1 – 28/1 WASP 8: 24/1 – 28/1
Thurs 25 Jan Lecture 11	Categorical Data Analysis Hypothesis Tests	12	10	GNAT 9: 25/1 – 30/1 WASP 9: 25/1 – 30/1
Mon 29 Jan Lecture 12	Categorical Data Analysis Odds ratios	13	10	WASP 10: 29/1 – 1/2 **Assignment 3 due**
Wed 31 Jan Lecture 13	Unit summary			
Wed 7 Feb Examination				

After completing a quiz you must View Results in order that your WASP is graded. If any of your WASPs appears as UNGRADED *then you should select View Scores for Quizzes from the 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 3 days to complete each quiz. You should complete these early, particularly your first attempt at each Gnat.