

School of Economics and Finance
QUAN 102 STATISTICS FOR BUSINESS

Trimester Two 2013

COURSE OUTLINE

- Lecturers:**
- Adrian Slack, RH315, 463-5233 ext 8571 (weeks 1-6)
contact: adrian.slack@vuw.ac.nz
 - John Randal, RH331, 463-5558 (weeks 7-12)
contact: john.randal@vuw.ac.nz
- Administrator:** Francine McGee, RH319, 463-5818, francine.mcgee@vuw.ac.nz
- Coordinator:** John Randal, RH331, 463-5558, john.randal@vuw.ac.nz
- Lecture times:** Tue, Thu, 9:00-9:50, KKLT303 (CRN 16016)
Tue, Thu, 1:10-2:00, MCLT103 (CRN 5010)
- Tutorial time:** Sign up online at <https://signups.victoria.ac.nz/>
- Course website:** <http://www.blackboard.vuw.ac.nz/>

Who to contact:

Academic problems (difficulty with material): contact your lecturer or ask your tutor
Administrative problems (blackboard, assignment marks, tutorial scheduling, medical certificates): contact Francine McGee, who will advise the course coordinator if necessary

Trimester Dates

Teaching Period: Monday 15 July - Friday 18 October

Study Period: Monday 21 October - Thursday 24 October

Examination Period: Friday 25 October - Saturday 16 November (inclusive)

Withdrawal from Course

1. Your fees will be refunded if you withdraw from this course on or before Friday 26 July 2013.
2. The standard last date for withdrawal from this course is Friday 27 September 2013. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on an 'Application for Associate Dean's Permission to Withdraw Late' including supporting documentation.

The application form is available from either of the Faculty's Student Customer Service Desks.

Course Learning Objectives

The course is an introduction to techniques of probability and statistics which are useful in business research or practice. The emphasis is on applications, rather than proofs, but some understanding of the concepts and an ability to communicate the meaning of the results is vital. By the end of the course students should be able to:

- Process data, using simple graphical techniques.
- Evaluate a range of sample statistics for univariate data, including mean, standard deviation, and percentiles.
- Evaluate and interpret a linear relationship between two variables.
- Use basic rules of probability to solve problems with up to 3 conditional events.
- Obtain probabilities from the binomial and normal distributions.
- State the central limit theorem, and discuss its applicability.
- Implement a range of hypothesis tests, and use these to draw conclusions about population parameters from sample data.
- Form confidence intervals for a range of population parameters, and interpret these intervals.
- Interpret the output of statistical software for advanced hypothesis tests via p -values.

All assessment gives an opportunity to demonstrate these objectives.

Course delivery

This course will be delivered by two lectures per week and a tutorial in 9 out of the 12 weeks. There will be two tests and four assignments.

Prescription

An introduction to techniques useful in business research or practice. Topics include graphs and diagrams, measures of location and dispersion, index numbers, probability, sampling, estimation and testing (z , t , chi-square, sign and Mann-Whitney tests), correlation and simple regression.

Readings

The text is: Clark and Randal (2010), *A First Course in Applied Statistics*, Pearson, ISBN 978-1-4425-4151-1. This is available from the Victoria Book Centre for \$84.30. The first edition of this book is not suitable. *Exercises and solutions from the first edition are available on Blackboard.*

Complementary books which might provide useful alternative explanations and practice exercises are:

- P. Belgrave and C. Jeffcoat (2004) *Statistics for Business*, Thomson (HF1017 B429 S).
- D.S. Moore and G.P. McCabe (2003) *Introduction to the Practice of Statistics (4th ed.)* W.H. Freeman: New York (QA276.12 M821 I 4ed).
- D.A. Lind, W.G. Marchal and S.A. Wathen (2005) *Statistical Techniques in Business and Economics (12th ed.)* Irwin: Homewood, Illinois (HA29 L742 S 12ed).

The VUW library has a web page that contains detailed information about library resources and has links to other sites. Its URL is <http://www.vuw.ac.nz/library>

Course content

Chapter references are to *the second edition* of Clark and Randal. You should prepare for each lecture by going over the indicated textbook sections - do not try to read it in detail until *after* the lecture. (Note: L = Lecture)

| Date | Lecture number | Topic | Text sections | Tutorial content |
|---|----------------|---|---------------|------------------|
| 16 Jul | 1 | Variables; processing data; stemplots | 2 | |
| 18 Jul | 2 | Summary statistics | 3.1, 3.2 | |
| 23 Jul | 3 | Standard deviation; boxplots | 3.2.3, 3.4 | L1-2 |
| 25 Jul | 4 | Scatterplots; correlation | 4.1-4.2 | |
| 30 Jul | 5 | Regression (estimation and assumptions) | 4.3 | L3-4 |
| 1 Aug | 6 | Regression (prediction) | 4.3 | |
| 5 Aug | | <i>Assignment 1 due 5.00pm, content: Lectures 1-4</i> | | |
| 6 Aug | 7 | Introduction to probability | 6.1-6.2 | |
| 7 Aug | | <i>Test 1, 60 minutes, 6.30pm, content: Lectures 1-6</i> | | |
| 8 Aug | 8 | Probability trees | 6.3 | |
| 13 Aug | 9 | Bayes' rule | 6.3.2 | L7-8 |
| 15 Aug | 10 | Distributions; binomial experiments | 6.4, 7.1 | |
| 20 Aug | 11 | Binomial distribution | 7.2-7.3 | L7-10 |
| 22 Aug | 12 | Normal distribution | 8.1 | |
| <i>Mid-trimester break, 26 August - 8 September</i> | | | | |
| 9 Sep | | <i>Assignment 2 due 5.00pm, content: Lectures 5-10</i> | | |
| 10 Sep | 13 | Central limit theorem | 8.2 | L11-12 |
| 12 Sep | 14 | Sampling distribution | 8.3 | |
| 17 Sep | 15 | Introduction to inference; intervals for a single mean | 9.1 | |
| 18 Sep | | <i>Test 2, 60 minutes, 6.30pm, content: Lectures 7-14</i> | | |
| 19 Sep | 16 | Testing for a single mean | 9.1 | |
| 23 Sep | | <i>Assignment 3 due 5.00pm, content: Lectures 11-14</i> | | |
| 24 Sep | 17 | Small sample testing for a single mean | 9.2 | L15-16 |
| 26 Sep | 18 | Inference for a proportion; margin of error | 9.4, 9.6 | |
| 1 Oct | 19 | Comparing two means, large samples | 10.1 | L17-18 |
| 3 Oct | 20 | Comparing two means, small samples | 10.2 | |
| 7 Oct | | <i>Assignment 4 due 5.00pm, content: Lectures 15-20</i> | | |
| 8 Oct | 21 | Paired comparisons | 10.5 | L19-20 |
| 10 Oct | 22 | Comparing proportions, contingency tables | 10.6, 12.2 | |
| 15 Oct | 23 | Contingency table testing | 12.2 | L21-22 |
| 17 Oct | 24 | <i>p</i> -values | 9.1.3 | |
| <i>Examination, see http://www.victoria.ac.nz/timetables/index.aspx</i> | | | | |

The following textbook content is not covered in this course: § 2.3.2, 4.2.2, 5, 8.4, 9.3, 9.4.3, 9.5, 10.4, 10.7, 11, 12.1, 12.2.2, 13.

There will be no tutorial in weeks 1, 4, and 8.

Lecture materials will be supported by practice in the tutorials, and through the assignments. Specific tutorial and assignment exercises will be distributed via Blackboard. You should try the problems in advance of attending the tutorial. The assignment will allow further practice of these skills.

Tutorials

To view and sign up to tutorials go to <https://signups.victoria.ac.nz/>. You should attend one tutorial per week. Tutorial sign up closes on Wednesday 17 July at midday.

Tutorial exercises from the textbook will be listed on Blackboard, and these should be attempted before the tutorial you attend. Bring your textbook and calculator to tutorials.

Assignments

There will be four short assignments, due roughly fortnightly as indicated above. Assignments will be issued on Blackboard and will consist of exercises from the *second edition* of Clark and Randal. The assignments will be given one of three marks:

- 0, indicating the assignment is of unacceptable quality
- 1, indicating reasonable understanding/accuracy, but some major flaws or omissions
- 2, indicating a complete assignment with some minor errors.
- 3, all attempted, all correct.

A mark of less than 4/12 would indicate that you may struggle to pass the test and/or final exam. Discussion of assignments with other students is allowed, but submitted work should be your own. Copied work (for all involved parties) is unacceptable and will not only count as having been missed, but may also initiate disciplinary action against the students concerned. Assignment feedback will be posted by all tutors on Blackboard Discussion Forum.

- *DO* head your assignments with
 - * your **NAME**,
 - * your **TUTOR'S NAME**, and
 - * the **TIME** of your tutorial.
- *DO* staple all sheets together.
- *DO NOT* fold your assignments or seal them shut.
- *DO NOT* put your work in a plastic sleeve.
- Submit into your tutor's assignment box next to (Murphy) MY221, by 5pm on the due date.

Marked assignments will be returned at the tutorial of the following week. Uncollected assignments will be disposed of at the end of the course. Missed or late assignments will be given a *zero mark*.

The assignments are *worth 10% of your final grade, determined as follows:*

| | | | | | | | | | | | | | |
|--------------------|---|---|---|---|---|---|---|---|---|---|----|----|----|
| Assignment total | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Grade contribution | 0 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 9 | 10 | 10 | 10 |

Expected workload

In weeks when there is a tutorial (see the course content above) you should spend 3 hours in class per week (2 lectures and 1 tutorial); in the remaining weeks you should spend 2 hours in class per week (2 lectures).

You should expect to spend an additional 6-8 hours per week reading, practising exercises and completing assignments. Overall it is expected that you will spend approxi-

mately 150 hours on completing this course.

Materials and Equipment

You must have a calculator that evaluates powers and has statistical options, including the evaluation of means and standard deviations. Correlation and regression options are useful, but not vital. (The recommended model is a modern Casio fx-82 - older versions of this model did not do regression, RRP approx \$30). Graphics calculators and programmable calculators are permitted, but not necessary. All programmable calculators must be reset prior to the test and exam.

Assessment Requirements

Assignments are worth 10% of your final grade (see above).

Two 60 minute multi-choice tests will be held on: Wednesday 7 August, 6:30pm (based on lectures 1-6); and Wednesday 18 September, 6:30pm (based on lectures 7-14). *These are each worth 20% of your final grade.*

The final exam will be two hours, will be long-answer (not multi-choice) and will be based primarily on lectures 15-24, although some material from earlier lectures may also be assessed. *This will be worth the remaining 50% of your final grade.*

Your assessed work may also be used for quality assurance purposes, such as to assess the level of achievement of learning objectives as required for accreditation and audit purposes. The findings may be used to inform changes aimed at improving the quality of FCA programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

Examinations

Students who enrol in courses with examinations are obliged to attend an examination at the University at any time during the formal examination period. The final examination for this course will be scheduled at some time during the following period: Friday 26 October - Saturday 17 November (inclusive).

Penalties

Late assignments will not be marked, unless an extension has been granted, in which case no penalties will apply.

Mandatory course requirements

You must attempt both tests.

If your performance in the test or assignments is affected by ill health you should take a medical certificate to the course administrator as soon as possible. If you do not meet the mandatory requirements, you may appeal to Dr Randal. For your appeal to have any chance of success, you must present evidence of special circumstances that caused you to fail. If you are denied and sit the final exam, you will still fail the course. If you cannot complete an assignment or sit a test or examination, refer to www.victoria/home/study/exams-and-assessments/aegrotat.

Class representative

A class representative will be elected in the first class, and that person's name and contact details made available to VUWSA, the Course Coordinator and the class. The class representative provides a communication channel to liaise with the Course Coordinator on behalf of students.

Communication of additional information

Additional information will be conveyed to students via Blackboard and/or email.

Emails may be sent to the address that you supplied with your enrolment; but they may also be sent to your SCS email address, which is your official university email address. You should keep an eye on both email addresses.

Student feedback

Student feedback on University courses may be found at http://www.victoria.ac.nz/feedback/feedback_display.php

Link to general information

For general information about course-related matters, go to <http://www.victoria.ac.nz/vbs/studenthelp/general-course-information>