

School of Economics and Finance  
**QUAN 102 STATISTICS FOR BUSINESS**

Trimester 3, 2014

**COURSE OUTLINE**

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**Administrator:** Pinky Shah, RH319, phone 463-5818  
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**Lecturer/Coordinator:** John Randal, RWW115, phone 463-5558  
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**Lecture times:** Tue, Wed, Thur, 9:00-10:50, KKLT303

**Tutorial time:** Sign up online at <https://signups.vuw.ac.nz/>

**Course website:** <http://www.blackboard.vuw.ac.nz/>

**Who to contact:**

*Academic problems (difficulty with material):* contact the lecturer, ask your tutor, or use Blackboard Discussion Board

*Administrative problems (blackboard, assignment marks, tutorial scheduling, medical certificates):* contact Pinky Shah, who will advise the course coordinator if necessary

**Trimester Dates**

*Teaching Period:* Monday 17 November to Friday 19 December 2014 (inclusive) covers the period from the first lecture to the final examination.

**Withdrawal dates:**

1. Your fees will be refunded if you withdraw from this course on or before one full week after the first class.
2. The standard last date for withdrawal from this course is Wednesday 10 December.

After the last date stated, 11 December, 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 any 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:

- C1 Process data, using simple graphical techniques.
- C2 Evaluate for univariate data a range of sample statistics, including mean, standard deviation, and percentiles.
- C3 Evaluate and interpret a linear relationship between two variables.
- C4 Use basic rules of probability to solve problems with up to three stages.
- C5 Obtain probabilities from the binomial and normal distributions.
- C6 State the central limit theorem, and discuss its applicability.
- C7 Implement a range of hypothesis tests, and use them to draw conclusions about population parameters from sample data.
- C8 Form confidence intervals for a range of population parameters, and interpret these intervals.
- C9 Interpret the output of statistical software for hypothesis tests via  $p$ -values.

All assessment gives an opportunity to demonstrate these objectives.

### Course delivery

This course will have three 2-hour lectures and two 1-hour tutorials per week over five weeks. It is expected that students will prepare for their tutorials and actively participate in them. There will be two tests and four assignments.

### Expected workload

You should expect to spend 8 hours in class per week (3 lectures, 2 hours each and 2 tutorials) and to spend 20 to 25 hours per week reading, studying, completing assignments, and most importantly, practising statistics. Overall it is expected that you will spend approximately 150 hours on completing this course.

### 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 VicBooks for \$84. The first edition of this book is not suitable. *Exercises and solutions from the first edition are available on Blackboard.*

The VUW library has a web page (<http://www.victoria.ac.nz/library>) that contains detailed information about library resources and has links to other sites. Many alternative introductory business statistics books are available.

### 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, 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.

### Tutorials

To view and sign up to tutorials go to <https://signups.victoria.ac.nz/>. Sign up will open at 1pm on Wednesday 12 November and close at noon on Wednesday 19 November.

You should attend two tutorials per week - one on Monday and one on Friday, starting on the Friday of week 1. They will cover material from the preceding lectures. Attendance at tutorials is not compulsory, however, it is highly recommended that you attend.

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.

## Course content

Chapter references are to *the second edition* of Clark and Randal. You should prepare for each lecture by going over the indicated text book sections - do not try to read it in detail until *after* the lecture.

Date	Lecture	Topic	Text	Tutorial
18 Nov	1	Variables; processing data; stemplots	2	
18 Nov	2	Summary statistics	3.1, 3.2	
19 Nov	3	Standard deviation; boxplots	3.2.3, 3.4	
19 Nov	4	Scatterplots; correlation	4.1-4.2	
20 Nov	5	Regression (estimation and assumptions)	4.3	
20 Nov	6	Regression (prediction)	4.3	
21 Nov		Tutorial 1		L1-4
24 Nov		Tutorial 2, <i>Assignment 1 due. To be handed in at tutorial</i>		L5-6
25 Nov	7	Introduction to probability	6.1-6.2	
25 Nov	8	Probability trees	6.3	
26 Nov		<i>Test 1, 60 minutes, 9:00am, content: Lectures 1-6</i>		
27 Nov	9	Bayes' rule	6.4	
27 Nov	10	Distributions; binomial experiments	6.4, 7.1	
28 Nov		Tutorial 3		L7-8
1 Dec		Tutorial 4, <i>Assignment 2 due. To be handed in at tutorial</i>		L9-10
2 Dec	11	Binomial distribution	7.2-7.3	
2 Dec	12	Normal distribution	8.1	
3 Dec	13	Central limit theorem	8.2	
3 Dec	14	Sampling distribution	8.3	
4 Dec	15	Introduction to inference; intervals for a mean	9.1	
4 Dec	16	Testing for a single mean	9.1	
5 Dec		Tutorial 5		L11-14
8 Dec		Tutorial 6, <i>Assignment 3 due. To be handed in at tutorial</i>		L15-16
9 Dec	17	Small sample inference for a single mean	9.2	
9 Dec	18	Comparing two means	10.1, 10.2	
10 Dec		<i>Test 2, 60 minutes, 9:00am, content: Lectures 7-14</i>		
11 Dec	19	Paired comparisons	10.5	
11 Dec	20	Inference for a proportion; margin of error	9.4, 9.6	
12 Dec		Tutorial 7		L17-18
15 Dec		Tutorial 8, <i>Assignment 4 due. To be handed in at tutorial</i>		L19-20
16 Dec	21	Comparing proportions; contingency tables	10.6	
16 Dec	22	Contingency table testing	12.2	
17 Dec	23	$p$ -value approach to testing	9.1.3	
17 Dec	24	Revision		
18 Dec		Revision		
19 Dec		<i>Examination, see <a href="http://www.victoria.ac.nz/timetables/">http://www.victoria.ac.nz/timetables/</a></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. In 10.2, we do not use pooled variance.

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.

## Assignments

There will be four short assignments, covering all nine CLOs, due weekly at your Monday tutorial 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 submit into the assignment box marked with your tutor's name on Level 2 of Murphy building.
- DO NOT fold your assignments or seal them shut.
- DO NOT put your work in a plastic sleeve.

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

### Examinations

You are obliged to attend the examination for this course at the University on Friday 19 December.

### Assessment Requirements

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

Two 60 minute multi-choice tests will be held on:

- Wednesday 26 November, 9:00-10:00am (based on lectures 1-6, CLOs 1-3); and
- Wednesday 10 December, 9:00-10:00am (based on lectures 7-14, CLOs 4-6).

*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 (CLOs 1,2,5-9). *This will be worth the remaining 50% of your final grade.*

In summary:

Assessment item	%	Details
Assignments (four)	10%	See course schedule on page 3 for details.
Test 1 (multi-choice)	20%	Wednesday 26 November, 9:00-10:00am
Test 2 (multi-choice)	20%	Wednesday 10 December, 9:00-10:00am
Exam	50%	Friday 19 December, 2 hours, closed book

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 FCom programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

### **Penalties**

Late assignments will not be accepted.

### **Mandatory course requirements**

In addition to obtaining an overall course mark of 50% or better, students must attend both tests, and submit at least two assignments.

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 <http://www.victoria.ac.nz/home/study/exams-and-assessments/aegrotat>.

### **Class representative**

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

### **Communication of additional information**

Blackboard will be the authoritative location of any information about this course.

We will trial an e-txt system this trimester. If you have a mobile number registered with the university, you may receive a small number of messages from us. The information contained therein will also be available on Blackboard.

We may use Blackboard to send email to you. This will go to your official university email address. Should you prefer to receive these to your personal email address, you can set up your VUW account to forward email. Instructions for doing so are available on Blackboard, in Course Resources.

### **Link to general information**

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