TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI

VICTORIA
UNIVERSITY OF WELLINGTON

School of Economics and Finance

QUAN 102 STATISTICS FOR BUSINESS

Trimester 1, 2016

COURSE OUTLINE

Prescription

An introduction to techniques useful in business research or practice. Topics include sampling, graphs and diagrams, measures of location and dispersion, correlation and simple regression, probability, estimation and hypothesis testing.

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.

Trimester Dates

Teaching Period: Monday 29 February to Friday 3 June
Study Period: Monday 6 June to Thursday 9 June
Examination Period: Friday 10 June to Wednesday 29 June (inclusive)

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
2 Mar	1	Variables; processing data; stemplots	2	None
3 Mar	2	Summary statistics	3.1, 3.2	
9 Mar	3	Standard deviation; boxplots	3.2.3, 3.4	L1-2
11 Mar	4	Scatterplots; correlation	4.1-4.2	
16 Mar	5	Regression (estimation and assumptions)	4.3	L3-4
18 Mar	6	Regression (prediction)	4.3	
21 Mar		*Assignment 1 due 5pm, content: Lectures 1-6*		L5-6
23 Mar	7	Introduction to probability	6.1-6.2	
		Easter break, 24 March – 30 March		
1 Apr	8	Probability trees	6.3	L5-6
6 Apr	9	Bayes' rule	6.4	Duty
7 Apr		*Test 1, 60 minutes, 6:30pm, content: Lectures 1-6*		
8 Apr	10	Distributions; binomial experiments	6.4, 7.1	
13 Apr	11	Binomial distribution	7.2-7.3	L7-10
15 Apr	12	Normal distribution	8.1	
18 Apr		*Assignment 2 due 5pm, content: Lectures 7-10.*		L11-12
20 Apr	13	Central limit theorem	8.2	
22 Apr	14	Sampling distribution	8.3	
		Mid-trimester break, 25 April – 1 May		
2 May		*Test 2, 60 minutes, 6:30pm, content: Lectures 7-14*		Duty
4 May	15	Introduction to inference; intervals for a mean	9.1	
6 May	16	Testing for a single mean	9.1	
11 May	17	Small sample inference for a single mean	9.2	L13-16
13 May	18	Comparing two means	10.1, 10.2	
16 May		*Assignment 3 due 5pm, content: Lectures 13-16.*		L17-18
18 May	19	Paired comparisons	10.5	
20 May	20	Inference for a proportion; margin of error	9.4, 9.6	
25 May	21	Comparing proportions; contingency tables	10.6	L19-20
27 May	22	Contingency table testing	12.2	
30 May		*Assignment 4 due 5pm, content: Lectures 17-20.*		L21-22
1 June	23	p-value approach to testing	9.1.3	
3 June	24	Revision		
		Examination, see http://www.victoria.ac.nz/timetables/		Duty

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* used 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.

Withdrawal dates:

1. Your fees will be refunded if you withdraw from this course on or before Friday 11 March, 2016.

2. The standard last date for withdrawal from this course is Friday 13 May, 2016. 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 any of the Faculty's Student Customer Service Desks or online at http://www.victoria.ac.nz/vbs/studenthelp/forms.

Lecturers:	Harold Cuffe, RWW115, 463-6708 (weeks 1-7)
	email: harold.cuffe@vuw.ac.nz
	John Randal, RHG21, 463-5558 (weeks 8-12)
	email: john.randal@vuw.ac.nz

| **Administrator:** | Ingrid Watts, RWW111, phone 463-5818 |
| | email: ingrid.watts@vuw.ac.nz |

| **Coordinator:** | John Randal, contact as above |

| **Lecture times:** | Wednesday and Friday, 14:10-15:00, KKLT303 (CRN 1482) |
| | Wednesday and Friday, 16:10-17:00, MCLT103 (CRN 4501) |

| **Tutorial time:** | Sign up online at https://student-sa.victoria.ac.nz/ |

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

Who to contact:

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

Administrative problems (blackboard, assignment marks, tutorial scheduling, medical certificates): contact Ingrid Watts, who will refer you to the course coordinator if necessary

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 four assignments, two tests, and one final examination.

Readings

None

Mandatory course requirements

There are NO mandatory course requirements. BUT, the following are highly recommended:

- attend both tests; and
- submit all assignments.

Expected workload

In addition to time spent in lectures and tutorials, as above, you should expect to spend an additional 6-8 hours per week revising your notes, reading, preparing tutorial exercises, completing assignments, and most importantly, practising statistics. Overall it is expected that you will spend approximately 150 hours completing this course.

Assessment Requirements

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

Two 60 minute multi-choice tests, *each worth 20% of your final grade*, will be held on:

- Thursday 7 April, 6:30-7:30pm (based on lectures 1-6, CLOs 1-3); and
- Monday 2 May, 6:30-7:30pm (based on lectures 7-14, CLOs 4-6).

You are obliged to attend the examination at the University at any time during the formal examination period, Friday 10 June to Wednesday 29 June (inclusive). The 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.*

Past tests and exams, with answers, are available on Blackboard (under the "Old Tests and Exams" tab). It is strongly recommended that you use these in your preparation.

In summary:

Assessment item	%	Details
Assignments (four)	10%	See course schedule on page 2 for details.
Test 1 (multi-choice)	20%	Thursday 7 April, 6:30-7:30pm
Test 2 (multi-choice)	20%	Monday 2 May, 6:30-7:30pm
Exam (long answer)	50%	Time/date TBC, 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 our programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

Assignments

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

- 0, indicating the assignment shows little evidence of learning and/or effort
- 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*. Assignments submitted to the wrong box will not be marked.

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

Tutorials

To view and sign up to tutorials go to https://student-sa.victoria.ac.nz/. This will open at 12.00pm on Thursday 25 February and close at 2.00pm on Thursday 4 March. Sign up as early as possible to get your first choice of day and time.

You should attend one tutorial per week, starting in week 2. There will be a total of 9 tutorials across the 12 teaching weeks. Each tutorial will cover material from the previous week's lectures.

Attendance at tutorials is not compulsory, however, it is highly recommended. You must attend the tutorial group to which you are assigned. If, because of work or timetable clashes, you are no longer able to attend your allocated tutorial, you must notify the course administrator to assist you to find a suitable tutorial time.

Tutorial exercises from the textbook will be listed on Blackboard, and these should be attempted *before* the tutorial you attend. Bring your textbook (or a photo or scanned image of relevant questions) and a calculator.

Dates and Times for duty tutor will be published on Blackboard. These drop in sessions will be prior to the tests and exam.

Penalties

Late assignments will not be marked.

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.
NB: if your exam is affected by ill-health or other personal circumstances, an aegrotat pass for the course is unlikely to be approved *unless you have demonstrated sufficient learning in the second half of the course via Assignments 3 and 4*.

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.

The text used as a source for most tutorial and assignment questions 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 $83.95. The first edition of this book is not suitable, however *exercises and solutions from the first edition are available on Blackboard.*

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

Student feedback

QUAN 102 was last reviewed in Trimester Two of 2015. As a result, we will continue to provide complete notes on Blackboard. It was pleasing to note that the workload for the course was deemed "about right".

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 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.

PASS – Peer Assisted Study Support

Research shows that studying with others can improve your grades. The PASS (Peer Assisted Study Support) programme offers optional study sessions, led by students who have successfully passed the course. PASS Leaders promote 'active' learning, and group members meet for one hour a week, working together to develop effective strategies for success. PASS begins in Week 3.

Sign-up online in Week 2 at http://www.victoria.ac.nz/st_Services/slss/whats-on/pass.aspx (NB: you will need to log-in using your student ID and password).

Early Alerts (Course Signals)

This course is using the Early Alerts (Course Signals) System which aims to help you to be successful in your study at VUW. The system is designed to help you assess your progress, so that you can adjust your work effort or seek support early in the trimester, to help you succeed.

You will receive a traffic light signal through the course Blackboard page:

Green tick means high likelihood of succeeding in the course (if your progress does not decline);

Yellow triangle means potential problem with succeeding in the course (if your progress does not improve);

Red cross means high likelihood of failing the course (if your progress does not improve)

You will also receive email messages from their Course Coordinator via your Blackboard email address, which by default is your @myVUW account.

Information on resources and support services are available at
http://www.victoria.ac.nz/students/support.

Link to general information

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