



Wollongong College Australia

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Diploma in Business and Diploma in IT

(CRICOS course codes: 057231C, 057232B)

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Subject Outline Summer 2009/10

WUCB121

Quantitative Methods 1

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Quantitative Methods 1

Subject Description

The aim of the subject is to introduce students to quantitative techniques and their application to business economics. The main focus of the subject is inferential statistics and topics will include descriptive statistics, probability, sampling, confidence intervals, hypothesis testing, elementary correlation, and regression analysis. Students are introduced to the use of computer programs for estimation and analysis.

Students who are enrolled in the Diploma in IT and achieve a clear pass in this subject will be awarded advanced standing for STAT131 once they articulate into the Faculty of Informatics.

Subject structure

Quantitative Methods I is delivered in a face-to-face format of five (5) hours per week. The subject consists of 3 hours of lecture and 1 x 2 hour tutorial each week. The session is of 14 week's duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in Weeks 13 and 14.

In addition to scheduled class sessions, students are expected to spend additional time in individual study and research. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every two hours of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during Week 1 of the Session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Some students may require tutorial support to improve language/literacy skills. Where this is recommended, students will be advised to use the College's self-access facilities in the Multimedia Centre in their own time. These facilities are located upstairs in building 30.

Peer Assisted Study Sessions (PASS)

Optional, but highly recommended is a one hour weekly [PASS](#) session. Statistics have shown that students who attend PASS every week have significantly better results than students who choose not to attend. For many students, PASS attendance has proven to be the difference between achieving a pass or a fail.

Excel and PH Stat2

In many practical applications of statistics, the statistician must deal with large amounts of data. As a part of statistical analysis, the statistician would have to perform various calculations using data; and the sheer number of computations involved makes this aspect of statistical method time-consuming and tedious. Fortunately, numerous commercially prepared computer packages are available to perform some or all of the calculations involved. In both lectures and tutorials, Excel and an add on for Excel called PH Stat 2 (available with the textbook) will be used to demonstrate the application of statistical techniques to problems in actual business and economic settings.

Learning resources

Compulsory Textbook

Berenson et al. (2010) *Basic Business Statistics: Concepts and Applications*, 2e, Pearson. ISBN 9781442500334

Additional Readings

Black, K et al. (2007). *Australasian Business Statistics*. Wiley. ISBN 978 0 47080 944 0.

Calculators

Students will be required to bring a scientific calculator to all classes.

Only approved scientific calculators will be permitted in exams. The list of approved calculators is located on the college website (www.wca.uow.edu.au). Students should refer to this list to confirm their calculator has been approved for use in exams.

Programmable calculators are not permitted. Programmable calculators usually have a RUN, EXE, CALC or SOLVE button.

Subject outcomes

Successful completion of Quantitative Methods I will enable students to:

- explain and demonstrate the basic concepts of probability and statistics.
- demonstrate in substantial depth the statistical techniques that are commonly used in the modern commercial world;
- apply statistical techniques to improve analysis and planning of the business decision-making process;
- interpret and explain solutions in non-technical way for a range of situations including business and commerce;
- use and interpret appropriate output from statistical computer packages, particularly Excel and PH Stat2; and
- evaluate the role played by statistics in empirical research and business practices in the workplace.

Subject outline in weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group.

The chapters referred to below are in the compulsory textbook, *Basic Business Statistics: Concepts and Applications*.

Week 1 Introduction to Descriptive Statistics

Emergency evacuation procedure.

Introduction to Quantitative Methods 1, including PASS Program.

CHAPTER 1:

- Understand how statistics is used in business.
- Understand the difference between descriptive and inferential statistics.
- Understand the types of data used in statistics.

Week 2 Descriptive Statistics (continued)

CHAPTER 2:

- Understand principle methods that fall under the heading of descriptive statistics. This includes frequency distributions tables, charts and diagrams.

CHAPTER 3:

- Understand summary measures of centre, variation and association.

Week 3 Probability Rules & Probability Distributions

CHAPTER 4:

- Understand the theory and concepts of probability, the topic that serves as a link between describing and presenting information obtained from samples and be able to make inferences to larger population.

CHAPTER 5:

- Understand the concept of a random variable, which allows us to summarise the results of an experiment in terms of numerical-valued outcomes.
- Understand the properties of probability distribution.
- Compute the expected value and variance of the probability distribution.

Week 4 Binomial Distribution & Normal Distribution

During first hour of lecture:

Class Test 1

During last two hours of lecture:

CHAPTER 5:

- Understand how to compute probabilities from binomial distributions.

CHAPTER 6:

- Understand normal distribution which is the most important specific continuous distribution.

Week 5 Sampling Distribution

CHAPTER 7:

- Understand sampling techniques.
- Understand the concept of sampling distribution.
- Compute probabilities related to the sample mean and sample proportion.
- Understand the importance of central limit theorem.

Week 6 Confidence Intervals

CHAPTER 8:

- The objective of estimation is to determine the approximate value of the population on the basis of the sample statistic.
- Develop confidence interval estimates for the population mean and proportion.
- Determine the sample size necessary to obtain a confidence interval.

Week 7 Hypothesis Testing: 1 population

CHAPTER 9:

- Understand the basic principles of hypothesis testing.
- Understand the errors and assumptions of hypothesis testing.
- Use hypothesis testing to test a mean or proportion.

Week 8 Mid Session Test

Mid Session Test

Week 9 Hypothesis Testing: 2 populations (continued)

CHAPTER 10:

- Introduction to hypothesis testing for two-sample tests involving numerical values.
- Hypothesis testing for two-sample tests involving numerical values (cont.).
- Use hypothesis testing for related samples.

Week 10 1 factor ANOVA (Analysis of Variance) & Chi Square Analyses

CHAPTER 10:

- Understand one-way analysis of variance, a technique that allows statisticians to determine whether differences exist among population means.

Week 11 Simple and Multiple Linear Regression

CHAPTERS 12 & 13:

- Introduce the concept of simple linear regression.
- Understand the techniques and assumptions involved in simple and multiple linear regression.
- Be able to develop a multiple regression model.
- Interpret the regression coefficients.

Week 12 Multiple Regression Analysis and Revision

During first hour of lecture:

Class Test 2 – based on Excel and PH Stat2 output

During second hour of lecture:

CHAPTER 13:

- Test and interpret the significance of the regression model.

During third hour of lecture:

Revision

Weeks 13 & 14 Final examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Assessment

Assessment and plagiarism policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the Wollongong College Australia Student Handbook <http://www.wca.uow.edu.au/handbook>

Assessment Schedule

Assessment Task	Due	Weighting	Length/Time
Class Test 1	Week 4	10%	45 minutes
Mid Session Test	Week 8	25%	1 hour 30 minutes
Class Test 2	Week 12	15%	50 minutes
Final Examination	Week 13/14	50%	3 hours

Note: A final mark of 50% or higher is required to pass ALL Diploma subjects. A mark between 45% and 49% is NOT a pass.

Marking Guidelines

WCA best practice is that students can normally expect to have assessment tasks handed back within two weeks, and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week.

Assessment criteria and explanation of components

All assessment components are marked according to set marking criteria.

Class Test 1

10%

Class Test 1 will be held in week 4 during the first hour of lectures.

This test contains the following material covered in the lectures during weeks 1 & 2 (chapters 1 – 3):

- Introduction to Descriptive Statistics
- Descriptive Statistics

Mid Session Test

25%

The mid-session test is one hour and 30 minutes in length. It will be held in week 8 during the first two hours of lectures.

This test contains the following materials covered in the lectures during weeks 3-6 (chapters 4 – 8):

- Probability Rules
- Probability Distribution
- Binomial Distribution
- Normal Distribution
- Sampling Distributions
- Confidence Intervals

Class Test 2

15%

Class Test 2 will be held in week 12 during the first hour of lectures.

Class Test 2 is a test based on Excel and PH Stat2 printouts. You will be required to complete several Excel and PH Stat2 exercises prior to the test and are required to bring this output to the exam to help you answer the questions.

The final exam is a 3-hour exam held during the college official exam period in weeks 13 & 14. It is a combination of multiple-choice questions and short answer questions.

The final examination contains the following material covered in the lectures during weeks 7-12 (chapters 9 – 13):

- Hypothesis Testing: 1 Population
- Hypothesis Testing: 2 Populations
- 1 factor ANOVA (Analysis of Variance)
- Chi Square Analyses
- Simple Linear Regression
- Multiple Linear Regression

Non-English speaking background students in the Diploma Programs may use foreign language dictionaries for their final exams. Diploma students who wish to use a dictionary must complete the Dictionary Use Application Form available at reception. This form and the dictionary must be submitted to reception **no later than 5pm Friday week 11** for approval.

Please note the following regulations regarding dictionary use:

- The only dictionaries permitted are language dictionaries, with word to word translations only.
- English-English dictionaries, Electronic dictionaries, Terminology dictionaries, or other are not permitted. The dictionary must not include English translations or explanations. Any dictionary that includes English explanations or phrases is not acceptable and will not be approved.