



MONASH University
Information Technology

MAT1097
Quantitative analysis

Unit Guide

Semester 1, 2010

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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MAT1097 Quantitative analysis - Semester 1, 2010

Chief Examiner:

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Lecturer(s) / Leader(s):

Gippsland

Assoc Prof Philip Rayment

Jo-ann Larkins

Malaysia

Dr Soo Leow

Introduction

Welcome to MAT1097: Quantitative Analysis, a core unit in the Bachelor of Information Technology and Systems (Business Systems) degree. This 6 point unit concentrates mainly on quantitative techniques which can be applied to various aspects of the business environment. It provides useful background for later units in the Business Systems sequence.

Unit synopsis

Topics covered include: The processes of modelling and analysis as a basis for decision making. Solution of linear systems, introduction to linear programming and its applications. Statistics: collection, presentation and interpretation of data, including time series data; simple linear regression and correlation. Probability, random variables and their distributions, application to decision-making under uncertainty. Populations and samples: sampling distribution of the sample mean; interval estimation and hypothesis testing for a population mean and proportion and for the difference between two means and proportions.

Learning outcomes

At the completion of this unit students will be able to:

- use some of the basic mathematical and statistical techniques applicable to analysis of business problems and to making decisions based on such analysis;
- implement these techniques using spreadsheet software and linked analysis tools.

Contact hours

1 hr lecture/wk, 1 hr laboratory/wk, 1 hr tutorial/wk

Workload

For on campus students, weekly workload commitments are:

- three one-hour lectures
- one-hour problem-solving tutorial
- one-hour PC laboratory incorporating Excel tasks as a device for deepening understanding of concepts and techniques
- a minimum of 6-7 hours of personal study in order to satisfy the reading and assignment expectations.

Off-campus students generally do not attend lecture and tutorial sessions, however, you should plan to spend equivalent time working through the relevant resources and participating in discussion groups each week.

Unit relationships

Prohibitions

MAT1060, MTH1210, ETX1642, GAS1751, STA1010, ETW1102

Teaching and learning method

Teaching approach

For on campus students, the three lectures per week provide the basis for students to master the key concepts and skills, and incorporate a large number of examples which extend the study material provided in the Unit Books.

The weekly tutorials are keyed to the preceding lectures, and provide students with opportunities to develop problem-solving skills with an emphasis on computationally non-intensive tasks for which a basic calculator is sufficient.

The weekly PC laboratory classes take the tutorials one step further, by utilising MS Excel as a computational tools for tasks encompassing both data analysis and simulation aspects.

Timetable information

For information on timetabling for on-campus classes please refer to MUTTS, <http://mutts.monash.edu.au/MUTTS/>

Tutorial allocation

On-campus students should register for tutorials/laboratories using the Allocate+ system: <http://allocate.its.monash.edu.au/>

Unit Schedule

Week	Date*	Topic	Study guide	Key dates
1	01/03/10	Introduction; functions and their graphs	SG 1 and 2	
2	08/03/10	Linear programming	SG 3	
3	15/03/10	Exploring and presenting data	SG 4	
4	22/03/10	Probability concepts and techniques	SG 5 first part	
5	29/03/10	Random variables and their distributions	SG 5 second part	
Mid semester break				
6	12/04/10	Decision making under uncertainty	SG 6	
7	19/04/10	Sampling and sampling distributions	SG 7	Assignment 1 due Wednesday
8	26/04/10	Estimation from random samples	SG 8	
9	03/05/10	Hypothesis testing	SG 9	
10	10/05/10	Linear regression modelling	SG 10	
11	17/05/10	Time series data	SG 11	
12	24/05/10	Index numbers	SG 12	Assignment 2 due Wednesday
13	31/05/10	Revision		

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*Please note that these dates may only apply to Australian campuses of Monash University. Off-shore students need to check the dates with their unit leader.

Unit Resources

Prescribed text(s) and readings

Albright, S.C., Winston, W.L. and Zappe, C. *Data Analysis and Decision Making with Microsoft Excel*, 3rd edition, Thomson South-Western, 2006. (ISBN0-324-40082-9)

The above edition is based on Excel 2003; as an alternative, a Revised 3rd edn based on Excel 2007 was published in 2009. These two editions are otherwise virtually identical, and you can safely use either one.

The earlier first edition, published in 1999, or second edition, published in 2003, may be used as an alternative; the Unit Books give references to all three editions.

Recommended text(s) and readings

Ayra, J.C. and Lardner, R.W. (1993). *Mathematical Analysis for Business, Economics, and the Life and social Sciences*, 4th edition, Prentice-Hall.

Berenson, M.L. and Levine, D.M. (1995). *Basic Business Statistics: Concepts and Applications*, 6th edition, Prentice-Hall.

Bierman, H., Bonini, C.P. and Hausman, W.H. (1986). *Quantitative Analysis for Business Decisions*, 7th edition, Irwin.

Buglear, J. (2005). *Quantitative Methods for Business: The A-Z of QM*, Elsevier.

Selvanathan, A., Selvanathan, S., Keller, G. and Warrack, B. (2000). *Australian Business Statistics*, 2nd edition, Nelson.

Shannon, J. (1995). *Mathematics for Business, Economics and Finance*, Jacaranda Wiley.

Swift, L. and Piff, S. (2005). *Quantitative methods for business, management and finance*, 2nd edn., Palgrave Macmillan.

Waters, D. (1997). *Quantitative Methods for Business*, 2nd edition, AddisonâWesley.

Watson, C.J., Billingsley, P., Croft, D.J. and Huntsberger, D.V. (1992). *Statistics for Management and Economics*, 5th edition, Prentice-Hall.

Required software and/or hardware

You will need access to Firefox or Internet Explorer browser, for working with the resources provided in Blackboard, and to Microsoft Excel, for use of its data analysis and charting facilities.

Equipment and consumables required or provided

Students studying off-campus are required to have the minimum system configuration specified by the faculty as a condition of accepting admission, and regular Internet access. On-campus students, and those studying at supported study locations may use the facilities available in the computing labs. Information about computer use for students is available from the ITS Student Resource Guide in the Monash University Handbook. You will need to allocate up to 3 hours per week for use of a computer,

including time for newsgroups/discussion groups.

Study resources

Study resources we will provide for your study are:

- A unit book containing detailed notes providing the learning objectives, topic content, required readings and review exercises;
- Weekly tutorial or laboratory tasks and exercises with sample solutions provided one to two weeks later;
- A guide to the use of Microsoft Excel in this unit;
- Assignments;
- A sample examination;
- Access to past examination papers;
- Discussion groups via Blackboard;
- A printed Unit Guide outlining the administrative information for the unit;
- The unit web site on MUSO, where some of the resources outlined above will be made available.

Assessment

Overview

Examination (3 hours): 60%; In-semester assessment: 40%

Faculty assessment policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit.

To pass this unit, a student must obtain :

- 40% or more in the unit's examination and
- 40% or more in the unit's non-examination assessment
and
- an overall unit mark of 50% or more

If a student does not achieve 40% or more in the unit examination or the unit non-examination assessment then a mark of no greater than 44-N will be recorded for the unit.

The continuous assessment carries a weighting of 40% and the end-of-semester examination 60%.

Assignment tasks

Assignment coversheets

Assignment coversheets are available via "Student Forms" on the Faculty website:

<http://www.infotech.monash.edu.au/resources/student/forms/>

You MUST submit a completed coversheet with all assignments, ensuring that the plagiarism declaration section is signed.

Assignment submission and return procedures, and assessment criteria will be specified with each assignment.

- **Assignment task 1**

Title:

Assignment 1

Description:

Incorporates tasks requiring material covered in Topics 1-5, some calculator based and some involving use of MS Excel.

Weighting:

15% for on-campus students and 20% for off-campus students

Due date:

Wednesday 21 April 2010

• **Assignment task 2**

Title:

Assignment 2

Description:

Incorporates tasks requiring material covered in Topics 6-11, some calculator based and some involving use of MS Excel.

Weighting:

15% for on-campus students and 20% for off-campus students

Due date:

Wednesday 26 May 2010

• **Assignment task 3**

Title:

Two "take-home" tests (on-campus students only)

Description:

The first of these tests covers Topics 2-4 and the second covers Topics 6-8.

They are designed to provide rapid feedback to on-campus students only.

Weighting:

5% each test for total of 10%

Due date:

To be advised in class.

Examination

• **Weighting:** 60%

Length: 3 hours

Type (open/closed book): Open book

Remarks:

The examination in this unit will be conducted during the end-of-semester examination period. The exam will be of three-hours duration, with a 10-minute reading period beforehand. The exam is open book, which means you are allowed to take into the exam all the MAT1097 material, that is, this *Unit Guide*, the *Unit Books*, your assignments and any printed solutions. You may also take into the examination your own handwritten notes and a calculator.

There is considerable danger in relying on the access to large quantities of written material, which the open book policy permits. It is recommended that prior to the exam you invest some effort in producing a brief summary of important definitions, formulae and other results.

All topics in the Unit Books are examinable. The assessment assignments do not cover Topic 12. This is to allow you enough time to cover Topic 12 while your second assignment is being assessed.

For 2010, the final examination paper will incorporate two sections:

Section A, carrying 30 marks, will consist of short, relatively straightforward questions covering all the material – you should attempt all questions.

Section B, also carrying 30 marks, will contain six questions each worth

10 marks. You should attempt three of these questions; if you attempt more, you will receive marks for all your work up to the maximum of 30 marks.

The six questions on Section B will span the following topics:

Topic 3: Linear Programming

Topics 5 and 7 combined: Probability, Random Variables and Sampling Distributions

Topic 8: Estimation from Random Samples

Topic 9: Hypothesis Testing

Topic 10: Introduction to Regression Modelling

Topic 11: Time Series Data

We recommend that you plan to devote about 90 minutes to Section A and then approximately 30 minutes to each chosen Section B question.

A sample examination paper (from Semester 1, 2008) is provided as part of the hard-copy Unit Guide, to give some indication of what you might expect by way of format and style of questions.

Other past exam papers may be accessed via the My.Monash portal page for MAT1097 or the on-line Library Catalogue.

See Appendix for End of semester special consideration / deferred exams process.

Due dates and extensions

Please make every effort to submit work by the due dates. It is your responsibility to structure your study program around assignment deadlines, family, work and other commitments. Factors such as normal work pressures, vacations, etc. are not regarded as appropriate reasons for granting extensions. Students are advised to NOT assume that granting of an extension is a matter of course.

Students requesting an extension for any assessment during semester (eg. Assignments, tests or presentations) are required to submit a Special Consideration application form (in-semester exam/assessment task), along with original copies of supporting documentation, directly to their lecturer within two working days before the assessment submission deadline. Lecturers will provide specific outcomes directly to students via email within 2 working days. The lecturer reserves the right to refuse late applications.

A copy of the email or other written communication of an extension must be attached to the assignment submission.

Refer to the Faculty Special consideration webpage or further details and to access application forms: <http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>

Late assignment

Assignments received after the due date (the date by which the assignment must reach Monash or its agent) will not usually be accepted unless an extension has been granted.

Return dates

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later.

Appendix

Please visit the following URL: <http://www.infotech.monash.edu.au/units/appendix.html> for further information about:

- Continuous improvement
- Unit evaluations
- Communication, participation and feedback
- Library access
- Monash University Studies Online (MUSO)
- Plagiarism, cheating and collusion
- Register of counselling about plagiarism
- Non-discriminatory language
- Students with disability
- End of semester special consideration / deferred exams