



UNIVERSITY  
OF TASMANIA

# **School of Economics**

**Faculty of Commerce**

## **BEA140 Quantitative Methods 1**

**Semester 2, 2003**

## **Unit Outline**

**Mr Steve Thollar**

CRICOS Provider Code: 00586B

# Contact details

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# Unit details

**Campus & Mode:** Hobart, Web CT Supported  
**Unit Weight:** 12.5%  
**Prerequisite:** TCE Mathematics Applied, Mathematics Stage 2, or equivalent  
**Teaching Staff:** Mr Steve Thollar

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## Unit description

This is a foundation unit in the mathematics of finance. It teaches students to describe and analyse business data. Compulsory unit in the BEc and BCom degrees.

## Aim

This unit is intended to provide a background capacity in mathematics of finance and statistical description and analysis, appropriate for a business student. The focus of the unit is on the practical use of data in a business/economic decision environment, especially in an environment of risk and uncertainty. It does not aim to produce experts in analysis and research.

## Learning outcomes

On completion of this unit, you should be able to:

- Use, and appreciate the importance of, sound practices in sampling, data description and presentation in a business environment.
- Apply basic probability concepts and probability distributions as an aid to business decision making.
- Use sample information to draw conclusions about properties of populations from which samples are drawn.
- Understand how an association between two variables can be used to explain variation and improve prediction.
- Demonstrate an understanding of the basic concepts of the time valuation of money, and apply these concepts to common situations in business/personal finance.

## Generic graduate attributes

Attribute	Description	Exemplars
Knowledge	<i>Graduates will have an in-depth knowledge in their chosen field of study and the ability to apply that knowledge in practice. They will be prepared for life-long learning in pursuit of personal and professional development</i>	<ul style="list-style-type: none"> <li>• Apply technical and information skills appropriate to their discipline or professional area;</li> <li>• Understand the limitation of, and have the capacity to evaluate, their current knowledge;</li> <li>• Learn both independently and cooperatively;</li> <li>• Learn new skills and apply learning to new and unexpected situations.</li> </ul>
Communication Skills	<i>Graduates will be able to communicate effectively across a range of contexts</i>	<ul style="list-style-type: none"> <li>• Demonstrate oral, written, numerical and graphic communication;</li> <li>• Present well-reasoned arguments, using technology as appropriate;</li> <li>• Access, organise and present information, particularly through technology-based activity.</li> </ul>
Problem Solving	<i>Graduates will be effective problem-solvers, capable of applying logical, critical and creative thinking to a range of problems. They will have developed competencies in information literacy</i>	<ul style="list-style-type: none"> <li>• Conceptualise problems and formulate a range of solutions;</li> <li>• Work effectively with others;</li> <li>• Find, acquire, evaluate, manage and use relevant information in a range of media.</li> </ul>
Global Perspective	<i>Graduates will be able to demonstrate a global perspective and inter-cultural competence in their professional lives</i>	<ul style="list-style-type: none"> <li>• Operate in a multicultural or global context.</li> </ul>

## Pre-requisites/co-requisites

### Assumed skills

- Arithmetic Skills
- Basic Algebra Skills
- Basic Calculator Operation

### Prerequisite/corequisite units

TCE Mathematics Applied, Mathematics Stage 2, or equivalent

## Texts, references and learning resources

### Prescribed text(s)

It is suggested that you have ready access to the following prescribed text

- Berenson, Levine & Krehbiel: *Basic Business Statistics*, Ninth Edition, Prentice-Hall, New Jersey, 2002

OR

- Berenson, Levine & Krehbiel: *Basic Business Statistics*, Eighth Edition, Prentice-Hall, New Jersey, 2002

The ninth edition will be available from the University Bookstore, whilst copies of the eighth edition may be available second hand.

### Recommended readings

Many students find it useful to consult alternative references as part of their study program. There is available in the Library a large number of texts pitched at the appropriate level, (located in the 515 section in the Morris Millar Library). Students can avail themselves of at least one of these as an additional source of worked examples, and for an alternate presentation of the material. The order of topics is essentially the same in most texts. The notation used varies a little from text to text.

## Other requirements

### Calculators

It is essential to have a calculator with minimal abilities to take square roots, raise to powers and with a memory. It is advantageous, but not necessary, to have a calculator with basic inbuilt statistical functions. It is possible to obtain a machine for around \$ 30 which will suffice. If in doubt, check with a tutor. It is **essential that students are competent in basic calculator operation**. It is probably wise to avoid buying a secondhand calculator if the original owner has lost the instruction manual.

### Microsoft Excel

Students will be shown how to use Excel as a computational tool in several parts of the unit. The ability to interpret a standard Excel regression output is examinable, but beyond this the acquisition of Excel skills is not examinable. However, many students may find Excel a quick and convenient way to check their calculations in assignments and practice problems. Spreadsheet skills are very transferable, both to other subjects and to the workplace.

## Teaching arrangements

### Lectures

There will be 13 two-hour lecture sessions in the unit. Lectures will cover the core examinable material in the unit.

### Hobart

Lectures will be held at the Hobart Campus in Stanley Burbury Lecture Theatre 1 (University Centre) and begin on Monday 14 July. Lectures will begin promptly at 12.00 noon and there will be a 10 minute break around the middle of the lecture.

Because the lectures will present only a part of the Unit's content for that week, students are urged to attend these and to have read the week's material in the Text before attending the lecture.

Comprehensive lecture notes are available via WebCT. They will usually be available weeks before the lecture in question. Many will students find it advantageous to bring these to lectures, and then annotate them as necessary, rather than copying down large quantities of material during lectures.

The unit is divided into four Modules. Detailed lecture overviews for Modules 1 to 4 are available via WebCT. Many students choose to print these prior to lectures and then annotate them during lectures. The Lectures folder on WebCT also contains a document called Extensions.doc, which contains some more advanced material beyond what is covered in lectures. Stronger students may wish to study this at their leisure. No more than 3% of the total assessment for the unit will relate to Extension material. For most students it is a more effective

use of their time to focus on the core material covered in lectures, and then only move on to extension material if they are confident with the core content.

## **Workshops**

Students are required to attend 12 Workshop sessions. These will be held weekly, commencing in Week 2. Workshops will consist primarily of guided problem solving and are intended to reinforce and extend material covered in lectures. Problem sheets will be available prior to Workshops. To benefit most you should prepare rough answers and come prepared to ask your Workshop instructor to explain parts of the subject that you have not fully understood. The allocation of students to Workshops will be done in the first lecture.

## **Automatic Booking System for Workshops**

Students will be assigned to a Workshop session automatically. You can check your allocations by visiting the workshop booking system at: <http://www.infosys.utas.edu.au/cgi/ctbs?action=modify> after 9.00am Monday 21st July. You will be able to change your allocated workshop times only when space in your preferred session is available.

Please note that staff in the School of Economics are not able to make changes to the automatic allocation.

## **Tutorials**

Voluntary tutorial sessions will be held for one hour per week commencing around week 4 or so. These are primarily for students in need of additional assistance. Time and venue for this will be advised when demand has been assessed.

## **Office Hours**

All students are able to consult the unit lecturers, tutors and workshop leaders on an individual or small group basis during their office hours or by appointment. Students experiencing difficulty in the unit are urged to make use of this service early in the semester. You will be notified of office hours for all teaching staff in the unit. Where possible please respect these times and make sure that you have tried to solve problems before seeking individual assistance.

## **Notice Board**

A timetable of important dates in the unit is included as part of this unit outline. Teaching staff will also regularly remind you of unit requirements. In addition, notices will be posted on WebCT under the heading "Announcements", advising students of important information including when new material etc that has been added to the BEA140 folder.

## Occupational health and safety (OH&S)

The University is committed to providing a safe and secure teaching and learning environment. In addition to specific requirements of this unit you should refer to the University's policy at: [http://www.admin.utas.edu.au/hr/ohs/pol\\_proc/ohs.pdf](http://www.admin.utas.edu.au/hr/ohs/pol_proc/ohs.pdf)

## Unit schedule

The content of this unit is organised into four modules. Detailed lecture outlines for modules will be available prior to lectures (see Section F). The timing will be approximately as detailed below.

Lecture	Week	Topic
<b>Module 1 - Business Mathematics</b>		
1	14	<u>Introduction</u> to unit. Summation notation. Introduction to mathematics of finance. Interest, present and future values of a single amount, solution for time and interest rate,
2	15	Effective and equivalent rates. Introduction to simple annuities. Perpetuities.
3	16	Amortisation, sinking funds, "flat rate" problems. (Including dealing with changes in interest rate, missed/extra payments, annuities due)
<b>Module 2 – Data</b>		
4	17	<u>Properties and Collection</u> - types, sources, sampling (random, non-random). Presenting raw data.
5	18	<u>Summary</u> – Summary measures for raw data, and for grouped data. (Including interpolation with grouped data)
6	19	<u>Summary and Presentation with Bivariate Data</u> - scatter diagram, correlation, principle of least squares, determining line of best fit, goodness of fit, explained & unexplained variation, Spearman's Rank Correlation Coefficient
<b>Module 3 – Probability</b>		
7	20	<u>Basic Probability</u> – concepts, laws, trees & tables, independence, Bayes rule
N/A	21	Mid Term Test

Lecture	Week	Topic
8	22	<u>Probability Distributions</u> - expectation, Poisson, binomial, normal, z-scores  (Including dealing with approximations and continuity correction)
9	23	<u>Sampling Distributions</u> – sampling distribution of means, sampling of proportions, Central Limit Theorem, interpreting conditional probabilities  (Including finite population correction factor, Student's t-distribution)
<b>Module 4 - Estimation &amp; Inference</b>		
10	24	<u>Estimation</u> - point & interval estimates using sample means & proportions, determination of optimal sample size, introduction to hypothesis testing
11	25	<u>Inference</u> - one sample tests of mean and proportion, types of error, one & two tailed tests, significance. <u>Bivariate Inference</u> - tests for existence of linear relationship, Chi-squared test for independence, test for significance of Spearman Rank Correlation coefficient.
12	26	Unit Review and Feedback

## Important Dates to Remember

Week	Date	Event
14	Week beginning 15 July	Lectures begin
15	Week beginning 22 July	Workshops begin
16	Friday 01 August	Mini-Assignment 1 due
19	Friday 22 August	Mini-Assignment 2 due
21	Week of 1-5 September	Mid Semester Test
23	Friday 19 September	Mini-Assignment 3 due
24	Friday 26 September	Major Assignment Due
<b>AVCC</b>	<b>29 September to 3 October</b>	<b>Mid Semester Break</b>
25	Friday 10 October	Mini-Assignment 4
26	Friday 17 October	Classes End
	20 October to 24 October	Study Period
	Saturday 25 October	Examinations Begin
	Tuesday 11 November	Examinations End

# Learning expectations and strategies

## Expectations

The University is committed to high standards of professional conduct in all activities, and holds its commitment and responsibilities to its students as being of paramount importance. Likewise, it holds expectations about the responsibilities students have as they pursue their studies within the special environment the University offers.

The University's Code of Conduct for Teaching and Learning states:

*Students are expected to participate actively and positively in the teaching/learning environment. They must attend classes when and as required, strive to maintain steady progress within the subject or unit framework, comply with workload expectations, and submit required work on time.*

## Learning strategies

If you need assistance in preparing for study please refer to your tutor or lecturer. For additional information refer to the Learning Development website : <http://www.utas.edu.au/learndev/>

If you will be using WebCT for the first time and would like some information on how to use WebCT refer to the following guide: [http://www.utas.edu.au/coursesonline/docs/using\\_webct.pdf](http://www.utas.edu.au/coursesonline/docs/using_webct.pdf)

Some of the units you will study use video conferencing to deliver lectures and tutorials. To enable you to get the best out of a video conference please refer to the following guide. <http://www.its.utas.edu.au/videoconf/vcstudentguide.pdf>

## Assessment

### Assignment

The assignment will consist of preparing answers to a variety of problems, with workings and procedures shown, and for which part marks may be awarded for incorrect answers. It is recommended that students work on the assignment in pairs. Where a student expects to have difficulty working in a team because of work or family commitments (etc) provision will be made for the student to submit the assignment as an individual.

The due date for the assignment is: End of Week 24 (Friday 26 Sep)
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Further administrative details, and requirements for presentation will be detailed during the first lecture.

## Mini-Assignments

There will be four of these during the semester, due at the end of weeks 16,19,23, and 25.

These will be individualised (ie. each student will have a unique set of problems derived from that student's enrolment number) and accessed from the network, designed to reinforce and test particular core skills, and done by students in their own time. They will generally comprise quite simple questions, and only the answers will be marked. The intention is to facilitate students' checking their understanding of a section of the work immediately after completing the topic and receiving feedback in the very short term. They will cover study needed to review current work and provide a reward for doing so. Their individualised nature is designed to avoid student co-operation in assignment preparation.

## Mid Semester Test

The test will be of approximately one hour's duration, and will be sat during normal lecture time, in week 21. Material covered up to the end of Module 2 (i.e. material covered up to the end of week 19) will be examined in the test. More detail will be available nearer the test day.

The test will be OPTIONAL. The test mark recorded for each student will be the maximum of their mark (out 10%) obtained for the test and one sixth of their mark (out of 60%) from the final exam.

For example:

Actual Test Mark (/10)	Exam Mark (/60)	Test Mark Recorded (/10)
2	30	$\text{Max}(2, 30/6) \Rightarrow 5$
8	42	$\text{Max}(8, 42/6) \Rightarrow 8$
Doesn't sit	36	$\text{Max}(0, 36/6) \Rightarrow 6$
Doesn't sit	Doesn't sit	$\text{Max}(0, 0/6) \Rightarrow 0$

If you do not understand this assignment of marks, please contact your lecturer.

## Assessment summary

Component	Weight/Value	Due date
Assignment	10%	26 September 2003
Mini Assignment 1	5%	1 August 2003
Mini Assignment 2	5%	22 August 2003
Mini Assignment 3	5%	19 September 2003
Mini Assignment 4	5%	10 October 2003
Mid Semester Test	10%	1 September 2003
Final Exam	60%	Exam Period
Total	100%	

## Submission of assignments

All work must have the School of Economics Assignment Cover Sheet attached. The cover sheet will be available on the unit page on WebCT.

Please remember that you are responsible for lodging your written work on or before the due date. We suggest that you keep a copy – photocopying is ideal. Even in the most 'perfect' of systems, items sometimes go astray. Lodge your assignments in the box marked BEA140 on Level 4, Foyer Area, Commerce Building. Work will be returned during classes. Uncollected assignments will be available from the Secretary's office, Room 407.

## Requests for extensions

Extensions will only be granted on the basis of consultation with your lecturer before the due date. If you are ill, please provide a medical certificate so that this can be noted. If you are unable to attend the mid-semester test due to circumstances beyond your control, please inform your lecturer or the School Secretary before the test date.

## Access to WebCT

The WebCT entry page is at <http://webct.utas.edu.au:8900/>. Click 'Log on to myWebCT' and enter the same username and password that you use for your University email account. Your personal WebCT page will appear, with the units in which you are enrolled listed at the top left of the screen. Click on the 'BEA140 Quantitative Methods 1' link to gain access to the home page for this unit. Details about WebCT features are available on <http://www.webct.com/quickstart>. If you run into problems with WebCT, contact the Help Desk on Telephone: 6324 3888, or Email: [HelpDesk@weboffice.utas.edu.au](mailto:HelpDesk@weboffice.utas.edu.au).

## Penalties

Late submission of assignments and other forms of assessment will incur a penalty of:

1 – business day late	=	10% penalty
2 – 5 business days late	=	25% penalty
More than 5 business days	=	100% penalty

## Academic referencing

Student writers need to back up their ideas by referring to scholarly literature, works of art and inventions that they have used. Failure to do so constitutes academic dishonesty (plagiarism), a matter considered by the University of Tasmania as a serious offence. It is important that students understand how to correctly refer to the work of others and maintain academic integrity.

The appropriate referencing style for this unit is

Baumol, William (1986), "Productivity Growth, Convergence and Welfare", *American Economic Review*, vol. 76, pp. 1072-85.

Maddison, Angus (1970), *Economic Progress and Policy in Developing Countries*, London, Allen and Unwin.

For information on presentation of assignments :

<http://www.utas.edu.au/library/assist/gpoa/gpoa.html>

Please read the following statement on plagiarism. Should you require clarification please see your unit coordinator or lecturer.

## Plagiarism

Plagiarism is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own; for example, using an author's words without putting them in quotation marks and citing the source, using an author's ideas without proper acknowledgment and citation or copying another student's work.

In fact the intentional copying and submission of someone else's work as one's own is a serious offence tantamount to academic fraud. It is a University offence punishable by a range of penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, exclusion from a unit, a course, or the University. **When in doubt consult your lecturer or tutor.** Details of penalties that can be imposed are available in the Ordinance of Student Discipline or at: [www.utas.edu.au/plagiarism](http://www.utas.edu.au/plagiarism)

Useful resources on academic integrity, including what it is and how to maintain it, are also available at [http://www.utas.edu.au/tl/academic\\_integrity/index.html](http://www.utas.edu.au/tl/academic_integrity/index.html)

## Additional assistance

If you are experiencing difficulties with your studies or assignments, have personal or life planning issues, disability or illness which may affect your course of study, you should raise these with your lecturer.

Student Services staff are located in Hobart, Launceston and Burnie and provide a wide range of services to assist students, they include:

- Student Counsellor
- Careers Adviser
- Disability Adviser
- Student Employment Service.

Or visit the Student Services website at :

<http://student.admin.utas.edu.au/services/>

Should you require assistance in accessing the Library visit their website for more information at <http://www.utas.edu.au/library/>

Your contact Librarian for this unit is :

Heather Mitchell (ext 2306)

International Services website provides information on the assistance available to international students, visit their site at :  
<http://www.international.utas.edu.au/index.html>

The Learning Development website has a wide range of resources on study skills and learning strategies, visit their site at : <http://www.utas.edu.au/learndev/>

## **Help resolving concerns about this unit**

If you have any concerns or complaints with the administration and/or management in this unit or your BEc course of either a general or personal nature, then you should in the first instance discuss the matter with your lecturer. If you feel that you would rather discuss the issue with an independent person within the School of Economics, then contact the Ombusperson:

**Dr Sarah Jennings**  
**School of Economics**  
**Room 413**  
email [sarah.jennings@utas.edu.au](mailto:sarah.jennings@utas.edu.au)

If the matter is still unresolved and you would like to know who to contact or the procedures for resolving your concern refer to the following website :  
<http://student.admin.utas.edu.au/services/complaints/index.html>

The Hobart based Tasmanian University Union (TUU) or the Launceston/Burnie based Student Association (SA) may also be able to assist.

## **Unit feedback**

The University of Tasmania, on a regular basis, evaluates its teaching and learning environment through the Student Evaluation of Teaching and Learning (SETL) system. The University values feedback from students and from time to time you will be asked to complete a SETL evaluation for a unit of study. For more information on SETL go to :

<http://student.admin.utas.edu.au/setl/index.html>