# Business and Financial Mathematics 7547
# Unit Outline, 2009

Faculty of Information Sciences and Engineering
University of Canberra

*Australian Government Higher Education (CRICOS)*
*Registered Provider number: #00212K*

This Unit Outline must be read in conjunction with:

(a) *Studying at the University of Canberra: A Guide to Policies and Procedures,* which sets out University-wide policies and procedures, including information on matters such as plagiarism, grade descriptors, moderation, feedback and deferred exams, and is available at `http://www.canberra.edu.au/student-services`

(b) *Guide to Student Services at the University of Canberra,* which is available at `http://www.canberra.edu.au/student-services`

(c) Any additional information specified in Section 6f.

## Contents



## 1: General information

**1a. Unit title:** Business and Financial Mathematics

**1b. Unit number:** 7547

**1c. Semester and year offered:** Semester 1, 2009

**1d. Credit point value:** 3

**1e. Unit level:** 2

**1f. Unit convenor:** Dr Ian Lisle

*E-mail:* Ian.Lisle@canberra.edu.au
*Office:* 11C9
*Phone:* 6201 2389

E-mail is the quickest and most reliable way to contact me.

Ian will be rostered for certain weekly hours in the SRC (Student Resource Centre 11A33/34), and this is one suitable regular contact point. However, students are welcome to make appointments to meet at other times.

*Unit moderator:* Dr. Peter Vassiliou

*E-mail:* Peter.Vassiliou@canberra.edu.au

**1g. Administrative contact details:**
Faculty of ISE office:

*E-mail:* ise@canberra.edu.au
*Office:* 11C15, 11B14
*Phone:* 6201 2619, 6201 2417.

# 2: Academic content

## 2a. Unit description and learning outcomes:

*Class Contact:* Up to 52 hours of classes per semester.

*Syllabus:* This unit will introduce fundamental mathematical methods in commerce and economics, such as matrices and calculus. The mathematics is motivated by being applied to finance, economics and data-fitting. Specific models in finance (such as valuation of cash-flow streams, and annuities) and in economics (such as input-output models) will be developed. Students will learn how to implement certain of these models using spreadsheets.

*Learning Outcomes:* Students will be expected to be able to demonstrate competence with the underlying mathematical methods; understanding of the models covered; and ability to apply this understanding to concrete computer implementation.

## 2b. Prerequisites and Corequisites:

*Prerequisite:* ACT College Mathematics Applications, or NSW Year 12 General Mathematics.

# 3: Delivery of unit and timetable

## 3a. Delivery mode:

The unit is delivered in face-to-face mode at UC Bruce campus over the standard semester.

It is also assumed that students can retrieve documents from the unit website, and by email at their UC student account.

## 3b. Schedule of classes and topics by week:

At time of printing, the unit timetable was as follows:

| Class Timetable | | | | |
|---|---|---|---|---|
| Lecture A | Monday | 15:30–17:30 | 11C43 | |
| Lecture B | Wednesday | 16:30–17:30 | 11C43 | |
| Computer Labs | Wednesday | 17:30–18:30 | 11B39 | Weeks 3, 6, 11, 14 |
| Tutorials | Wednesday | 17:30–18:30 | 11C43 | Other weeks |

Students should attend both lectures and the tutorial each week. Lectures meet every teaching week. Tutorials will start in Week 2 and will meet each teaching week after that. In weeks 3, 6, 11, 14 the tutorial hour is scheduled as a computer lab. There is no lecture on Monday of Weeks 3 and 10 (due to respectively Canberra Day and Anzac Day).

A lecture schedule is provided separately. This schedule is only a guide: we reserve the right to vary the content, sequence and speed of delivery in response to class needs.

# 4: Unit resources

## 4a. List of texts / readings:

D.G. Luenberger. 1998. *Investment Science.* Oxford Uni Press.
Covers both fixed interest securities and also stock portfolio models as well as some more advanced material.

The following books can be used for background, in some cases more elementary, in some more advanced:

- T.J. Watsham and K. Parramore. 1997. *Quantitative Methods in Finance.* Thomson, London.
  An excellent, though terse, introduction to mathematical and statistical methods in finance. Assumes more background knowledge and moves faster than we can.
- E.F. Haeussler, R.S. Paul and R. Wood. 2005 (11th ed.). *Introductory Mathematical Analysis: for business, economics and the life and social sciences.* Pearson Education. Plodding but useful treatment of some of our topics. (This is the textbook for Mathematical Methods.) OK on applications without being outstanding.
- D.M. Knox, P. Zima and R.L. Brown. 1999. *Mathematics of Finance.* McGraw-Hill. More elementary than the others, covers annuities, loans etc. in gory detail but never gets to calculus or matrices, so covers only a small part of our semester.

- J. Soper. 2004 (2nd ed.). *Mathematics for Economics and Business.* Blackwell. Covers economic models very well and finance only in passing, but a good book at about the right level (the first chapters are very elementary). Includes CD, spreadsheets etc.

### 4b. Materials and equipment:

- Scientific calculator – non-alpha keyboard. Your calculator should have square root, powers, exponentials and logs ($\sqrt{\ }$, $x^y$, $e^x$, $10^x$, $\ln x$, $\log x$).
- You will need access to a computer with e-mail, a web browser, Adobe Acrobat Reader and Microsoft Excel.

For instance, machines in the Windows labs in Buildings 10 and 11 are suitable.

Note that the website will provide some resources (especially any printed handouts). But it is definitely *not* going to be a comprehensive site, and cannot serve as a substitute for attendance at face-to-face classes.

### 4c. Unit website:

A Moodle site will be maintained, at: `http://learnonline.canberra.edu.au/`

## 5: Assessment

**5a. Assessment overview:** A composite score will be computed based on the following items:

| Item | Weight | | Due Date | |
|---|---|---|---|---|
| Class Test 1 | 15% or 25% | Wednesday | 25/3/2009 | (Week 5) |
| Assignment 1 | 10% | Thursday | 9/4/2009 | (Week 7) |
| Class Test 2 | 15% or 25% | Wednesday | 13/5/2009 | (Week 12) |
| Assignment 2 | 10% | Friday | 29/5/2009 | (Week 14) |
| Final Exam | 40% | During Exam period. | | |

### 5b. Details of each assessment item:

*Class Tests* The two tests will be held in the normal lecture time and room, and will each be 50 minutes in duration. The permitted materials for each class test are: 1xA4 side of original handwritten notes, scientific calculator (non-alpha) and language dictionary. A calculator is *assumed.*

The weighting scheme is as follows. If your score on Test 1 is higher than your score on Test 2, then your Test 1 mark will be scaled to a mark out of 25, and your Test 2 mark to one out of 15. If your score on Test 2 is the higher, the weights will be reversed. In effect, if you do poorly on one of the Tests, you have some opportunity to recover on the other.

***Assignments*** These will consist of questions which may include both theory and spreadsheet implementation.

Due dates for the assignments may be varied, but only by a few days. Late penalties may apply for work submitted late without approval. Assignments are to be individual work. Work that appears to be copied will be penalized.

***Final Exam*** The Final Exam will be 2 1/2 hours long, and will be held during the exam period at the end of semester. The permitted materials for the final exam are: 2xA4 sides of original handwritten notes, scientific calculator (non-alpha) and (non-electronic) language dictionary. It is *assumed* you have a scientific calculator at the exam.

### 5c. Special assessment requirements:

Satisfactory performance on the Final Exam is required to achieve passing grades. The definition of 'satisfactory' is as follows:

| Grade: | Overall Scaled Score | Scaled Exam Score |
|---|---|---|
| HD | $\geq 85$ | $\geq 75$ |
| Di | $\geq 75$ | $\geq 65$ |
| Cr | $\geq 65$ | $\geq 50$ |
| P | $\geq 50$ | $\geq 40$ |

Thus to obtain one of the above grades in BFM, it is required that you meet *both* the criteria in the corresponding row of the table.

### 5d. Supplementary assessment:

For the university policy on supplementary assessments, see *Studying at the University of Canberra: A Guide to Policies and Procedures* at `http://www.canberra.edu.au/student-services`

**5e. Text-matching software** Not applicable.

## 6: Student responsibility

### 6a. Workload:

The amount of time you will need to spend on study in this Unit will depend on a number of factors including your prior knowledge, learning skill level and learning style. Nevertheless, in planning your time commitments you should note that for a 3cp unit, the total notional workload over the fifteen week semester is assumed to be 150 hours, or an average of 10 hours per week. These hours include time spent in classes.

### 6b. Special needs:

Students who need assistance in undertaking the unit because of disability or other circumstances should inform the unit convenor or the Disabilities Office as soon as possible so the necessary arrangements can be made.

### 6c. Attendance requirements:

The primary delivery mode is face-to-face, and it is expected that you attend the classes.

### 6d. Required IT Skills:

All students are assumed to be able to:

- Read and print documents on the unit website – mostly they will be in Adobe PDF format.
- Communicate using e-mail.
- Students will be expected to acquire proficiency with Excel spreadsheets.

### 6e. Costs:

Apart from normal fees, students should expect to pay purchase costs for the text, and to pay some printing costs.

**6f. Additional Information:** It is assumed that all students will regularly (at least weekly) open the unit's website and read any announcements there. It is also assumed that all students will regularly read e-mail received at their UC student accounts – at least twice a week. Announcements made at lectures, or circulated by e-mail to UC student accounts will be deemed to have been made to the whole class.

## 7: Student Feedback

All students enrolled in this unit will have an opportunity to provide anonymous feedback via the Unit Satisfaction Survey which will be presented to you on OSIS. Your lecturer or tutor may also invite you to provide more detailed feedback through an anonymous in-class questionnaire administered through the University's Teaching and Learning Centre (TLC).

## 8: Authority of this unit outline

Any change to the information contained in Section 2 (Academic content), Section 3 (Delivery of unit and timetable) and Section 5 (Assessment) of this document, will only be made by the Unit Convenor if the written agreement of staff and a majority of students has been obtained; and if advice of the change is then forwarded to each student enrolled in the unit, either by email to their student address or by mail to their registered term address. Any individual student who believes him/herself to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convenor.
Note that the lecture schedule is a guide only. The lecture sequence and topics may be varied.
Note also that due dates for the assignments may be extended if circumstances warrant it.