[ACTL90001]  
[Mathematics of Finance I]  

SUBJECT GUIDE  

Semester 1, 2015  

Prepared by  
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Department of Economics  
Faculty of Business and Economics
Subject Outline

Introduction

Welcome to ACTL90001 Mathematics o Finance I. It is a one-semester 12 week courses of approximately two-hour lectures and one tutorial per week for post-graduate students. This subject will provide you with an introduction to financial mathematics and meet the syllabus of the Institute and Faculty of Actuaries Subject CT1.

Subject Aims

The overall aim of this subject is to provide grounding in financial mathematics and their simple applications.

Prescribed References

The text is “Compound Interest and its applications” by Fitzherbert and Pitt. This should be available from the University Bookroom. You will be expected to read this and attempt exercises from it throughout the semester.

Learning Outcomes

Subject Objectives

On successful completion of this subject students should be able to:

- Apply relevant pre-requisite mathematical knowledge in the solution of a range of practical problems;
- Describe and apply the main methods of finding the accumulation or present value of money under simple and compound interest and discount;
- Derive and apply formulae to calculate the accumulation or present value of a series of payments, including the cases of continuous payments and variable interest rates;
- Analyze and solve equations of value for rates of interest;
- Calculate rates of return on investment portfolios using methods employed by actuaries;
- Construct and analyze a loan schedule, including cases when terms of a loan are altered;
- Analyze financial aspects of projects using discounted cash flow techniques;
- Explain the key features of the main types of financial assets, including shares, bonds, property and derivatives;
• Perform compound interest calculations relating to financial assets, including the calculation of price and yield;

• Calculate the delivery price and the value of a forward contract using arbitrage free pricing methods;

• Perform calculations relating to the term structure of interest rates;

• Derive results for simple stochastic models for investment returns, and apply these results.

To view the learning goals, generic skills and graduate attributes for your degree, please locate the University Handbook entry for your degree at:  http://handbook.unimelb.edu.au/

**Generic Skills**

In this subject you will have the opportunity to develop important generic skills. These include: written communication; problem solving; application of theory to practice; synthesis of data and other information; use of computer software.

**Prerequisites**

Students who have not previously studied probability theory must take MAST20004 Probability (may be taken concurrently with this subject).

**Academic Staff Contact Details**

**Lecturer Contact Details**

Zhuo Jin

Email: zijin@unimelb.edu.au

Room: FBE Room 318

Consultation Hours: 11:00 to 12:00 Monday and by appointment

**Lectures and Tutorials**

**Lecture Times**

There will be 2 lectures a week. Consult the timetabling system for the times and locations. Slides will be available through the LMS.

**Lecture Participation Requirements**

Attendance at all lectures and tutorials are important.
Tutorial Times

Monday, 13:00 – 14:00; Alice Hoy-332

Tutorial Participation Requirements

The tutorial problems will be based on the previous week’s materials and be posted on the LMS after lectures. It is expected that all students will attempt tutorial questions ahead of tutorial classes, and will participate in answering questions at tutorials.

Enrolling in Tutorials Using Alloc8

Alloc8 is the University’s online tutorial allocation system. You must enrol in a tutorial for this subject using Alloc8 as soon as possible. Late enrolment into tutorials is handled by the Commerce Student Centre (Ground Level, Babel Building). More information about Alloc8, including cut-off dates and a link to the login page, can be found on the Faculty’s website.

Using Lectopia

This subject does not use the Lectopia service. This is a deliberate decision as Lectopia will not benefit students given the nature of this subject. Success in this subject is strongly related to attentiveness at lectures and tutorials, and thorough preparation for tutorials. It is strongly recommended that you attend all lectures and tutorials.

Assessment

Assessment Overview

Your assessment for this subject comprises the following:

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment</td>
<td>To be advised</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-semester exam</td>
<td>Week 7</td>
<td>20%</td>
</tr>
<tr>
<td>End-of-semester exam</td>
<td>Assessment period</td>
<td>70%</td>
</tr>
</tbody>
</table>

- The mid-semester exam will take place on the Thursday of week 7 (23th of April).
- A 2 hour final exam will be given during exam period.

Exam Policy

The Faculty requires that you are available for the entire examination period. Supplementary exams will not be provided in cases of absence during the examination period, unless the absence is due to serious illness or other serious circumstances.
In the mid-semester and end of semester exams you may only use one of the following calculators:

- Casio FX82 (with or without any suffix)
- Casio FX83 (with or without any suffix)
- Casio FX85 (with or without any suffix)
- Sharp EL531 (with or without any suffix)
- Texas Instruments BA II Plus (with or without any suffix)
- Texas Instruments TI-30 (with or without any suffix)

**Using the Assignment Tool**

The Assignment Tool allows you to submit your assignment to your lecturer online from home or from any of the student labs on campus.

During the course of the semester, you’ll be asked to submit one or more assignments in electronic format into the Assignment Tool. You can access the Assignment Tool by clicking on Assignment Tool in the navigation menu from the LMS page for this subject.

**Plagiarism and Collusion**

Presenting material from other sources without full acknowledgement (referred to as plagiarism) is heavily penalised. Penalties for plagiarism can include a mark of zero for the piece of assessment or a fail grade for the subject.

Plagiarism is the presentation by a student of an assignment identified as his or her own work even though it has been copied in whole or in part from another student’s work, or from any other source (eg. published books, web-based materials or periodicals), without due acknowledgement in the text.

Collusion is the presentation by a student of an assignment as his or her own work when it is, in fact, the result (in whole or in part) of unauthorised collaboration with another person or persons. Both the student presenting the assignment and the student(s) willingly supplying unauthorised material are considered participants in the act of academic misconduct.

**Special Consideration**

Students who have been significantly affected by illness or other serious circumstances during the semester may be eligible to apply for Special Consideration.

The following website contains detailed information relating to who can apply for Special Consideration and the process for making an application:
http://fbe.unimelb.edu.au/csc/assistance/special_consideration

Other Subject Resources

The following resources are provided to assist your learning:

Supplementary Readings

McCutcheon, J. J. and Scott, W. F. *An introduction to the Mathematics of Finance.*

McDonald, R. *Derivative Markets.*

Hull, J. C. *Options, Futures, and Other Derivatives.*

Institute and Faculty of Actuaries. *Subject CT1 Core Reading.*

Email Protocol

Please note that we are only able to respond to student emails coming from a University email address. Please do not use personal email addresses such as Yahoo, Hotmail or even business email addresses. Emails from non-University email addresses may be filtered by the University’s spam filter, which means that we may not receive your email. All correspondence relating to this subject will only be sent to your University email address. Note that you must first activate your University email address before you can send or receive emails at that address. You can activate your email account at this link: [http://accounts.unimelb.edu.au/](http://accounts.unimelb.edu.au/).

While academic staff endeavor to address queries received via email, it is more appropriate to resolve substantive questions during lectures and tutorials and during normal consultation hours. With this in mind, we encourage students to attend all lectures and tutorials and to familiarise themselves with the consultation hours offered by the lecturers and tutors in this subject.

LMS Discussion Board

The Discussion Board for this subject can be accessed via the LMS subject page and allows you to post messages and read messages at any time. All students are free to communicate with each other using the Discussion Board by posting, reading, and replying to messages.

The discussion forum is organised into threads (conversations within a topic). Messages are posted by starting a new thread or replying to an existing posting. To access the Discussion Board, click on the Discussion Board located in the navigation menu of the LMS page for this subject.

Always be polite when asking questions or posting replies. Impolite language will not be tolerated. The lecturer reserves the right to ban students who use inappropriate/impolite language from using the Discussion Board.
Note that the Discussion Board is different to the Online Tutor in that only your lecturer or the designated online tutor can respond to questions. If you have a question that you want to ask your lecturer or tutor, please use the Online Tutor rather than the Discussion Board.

**Teaching & Learning Unit**

The Teaching and Learning Unit offers a wide range of support services to students. If you are having any difficulty in studying for this subject you could arrange a consultation with the Unit’s learning skills specialist. The learning skills specialist can review your current approaches to study and offer advice on how to adjust to the demands of tertiary study. If you are a student from a non-English speaking background there is an English as a Second Language specialist who is available to help with your written work. Both of these specialists are available for face-to-face consultations or electronically through email. Go to the Faculty office to arrange for consultations or contact the specialists electronically through the Teaching and Learning Unit web page. The web page also contains a wide variety of study skills topics and information sheets for students, and a timetable of up-coming events, including focussed workshops, designed to support Economics and Commerce students in their study.

The Teaching and Learning Unit is located on the 2nd floor of the Babel Building. Make use of the Teaching and Learning Unit. It is there to help.

**Credit for Professional Examinations**

University of Melbourne students seeking exemption for corresponding examinations of the Institute of Actuaries of Australia should note that performance in assignments and the mid-semester test is not taken into account. Recommendation for exemption in Subject CT1 is based on the combined mid-term and end-of-semester examination results of Mathematics of Finance I. Exemption lists will be posted on the Centre’s website.