ACTL20001
Financial Mathematics I

SUBJECT GUIDE

Semester 1, 2014

Prepared by
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Centre for Actuarial Studies
Department of Economics
Faculty of Business and Economics
Subject Outline

Introduction

Welcome to your first “real” actuarial subject --- Financial Mathematics I. This is a very important subject. Not only does it give you an opportunity to receive the exemption for CT1 from the Institute of Actuaries of Australia (together with Financial Mathematics II), but also it enables you to continue your actuarial study. So take it seriously and do your best, although you may think it looks an easy subject.

Subject Aims

The overall aim of this subject is to provide a thorough grounding in the theory and concepts of compound interest, and to develop a proficiency in the application of these concepts in a variety of practical situations when the timing and amounts of cash flows are known.

Suggested References

The text is “Compound Interest and its applications” by Fitzherbert and Pitt. It is available in university bookshop and will be used for both Financial Mathematics I&II. Chapter 1-4 will be covered in Financial Mathematics I. You will be expected to read this and attempt exercises from it throughout the semester.

Also useful are

McDonald, R.L., Derivatives Markets.
Institute and Faculty of Actuaries. Subject CT1 Core Reading.

Learning Outcomes

Subject Objectives

On successful completion of this subject you 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;

• Analyse and solve equations of value for rates of interest;

• Construct and analyse a loan schedule, including cases when terms of a loan are altered;
• 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.

**Generic Skills**

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

**Awareness Issues**

At a broader level, studying this subject will increase your awareness of issues such as: compound interest functions; valuation of a series of payments, including where the cash flows and/or the force of interest are continuous functions of time; equations of value; loans repayable by instalments; characteristics of major asset types; and discount valuation of fixed interest securities, ordinary shares and property, including effects of tax.

**Contact Details**

**Lecturer Contact Details**

The coordinator and lecturer for this subject is Dr Zhuo Jin.

Email: zjin@unimelb.edu.au

Room: Room 318, FBE Building

Consultation Hours: 1:00pm to 3:00pm Tuesday

**Tutors**

Beatrice Chan, Le Pham, Yong Seen See.

**Email Protocol**

While academic staff endeavor to address queries received via email, it is more appropriate to resolve substantive questions face-to-face during normal consultation hours. With this in mind, we encourage all students to familiarize themselves with the consultation hours offered by the lecturer in this subject.

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/).

**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.

**Tutorials**

Tutorials will take place in weeks 1 through 12. The questions and solutions will be posted on the LMS. Please book your tutorials on the LMS.

**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 Economics & Commerce Undergraduate Student Centre. More information about Alloc8, including cut-off dates and a link to the login page, can be found on the Faculty’s website:


**Assessment**

**Assessment Overview**

Your assessment for this subject comprises the following:

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<tr>
<th>Assessment Task</th>
<th>Due</th>
<th>Weighting</th>
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<tbody>
<tr>
<td>Assignment 1</td>
<td>To be advised</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-semester exam</td>
<td>Week 7, subject to confirmation, in lieu of a</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>lecture</td>
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<tr>
<td>Assignment 2</td>
<td>To be advised</td>
<td>10%</td>
</tr>
<tr>
<td>End-of-semester exam</td>
<td>Assessment period</td>
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Mid-semester exam

- This is a closed-book exam. The total time allowed is 50 minutes including 5 minutes reading time.

- This exam contributes 10% to the assessment in this subject.

- Electronic calculators may be used. However, calculators that can be programmed to store or retrieve text or formulae are not permitted. Also, calculators that have been tampered with since manufacture are prohibited. In addition to the above restriction, the calculator must also appear on the following list:

  - 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)

It is the responsibility of the student to ensure any calculator they use complies with University requirements. These restrictions of calculators also apply to the end-of-semester examination.

End-of-semester exam

- This is a two-hour closed-book exam. The reading time is 15 minutes. This exam contributes 70% to the assessment in this subject.

- Electronic calculators may be used subject to the same restrictions that apply to the mid-term examination described above.

- Satisfactory completion of this subject requires a pass in the end of semester examination.

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 may be asked to submit assignment(s) 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.

However, it is more likely, in this subject that you will be asked to submit your assignment in hard copy (instead of submitting electronically). Your lecturer will let you know which submission method to use before each assignment period.
commences. When submitting an assignment in hard copy, you must first print out an assignment cover sheet via the Assignment Tool, then complete the cover sheet and attach it to your assignment before your submission.

**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.


**Late Submission**

Late assignments, where approval for late submission has not been given, will be penalised at the rate of 10% of the total mark per day, for up to 10 days, at which time a mark of zero will be given.

**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:


**Group Work**

Working in groups can sometimes be more difficult than working individually. However, team-work and organisational skills associated with group work are highly valued by employers. With careful management and ongoing communication, you can have a successful and rewarding experience working in a team.
You should exchange names, phone numbers, and email addresses with your group members straight away.

If you have difficulty with a member of your group, you should contact your lecturer as soon as possible. Do not leave issues unresolved until just before or after your group assignment is due.

All students within your group will be given the same mark unless you have raised an issue during the assignment period. Students who do not contribute to a group assignment may be allocated a lower mark or assigned a mark of zero.

**Further Assistance**

If you need assistance during the semester, short questions can be asked during lectures and/or tutorials. For longer discussions you will need to see the lecturer-in-charge.

**Specimen Exam and Practical Exercises**

Practical exercises are included in the workbook. A specimen exam paper and the solutions will be available on the LMS.

**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 a Second Language specialist who is available to help with your English 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 in The Spot, 198 Berkeley St. Please visit the TLU’s website – [http://tlu.ecom.unimelb.edu.au/](http://tlu.ecom.unimelb.edu.au/).

Make use of the Teaching and Learning Unit. It is there to help.

**Other Information**

**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 end-of-semester examination results of ACTL20001 Financial Mathematics I and ACTL20002 Financial Mathematics II. Exemption lists will be posted on the Centre’s website.