Financial Mathematics III

SUBJECT GUIDE

Semester 1, 2015

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

Introduction

Welcome to Financial Mathematics III. In this guide, we give you administrative and structural information regarding the course.

Subject Aims

The overall aim of this subject is to teach you the mathematics underlying Modern Portfolio Theory: the fundamental question we attempt to answer is how to choose an investment amongst many possible investment opportunities under the fundamental assumption that those investments are correctly priced.

Suggested References

The textbook is:

Introduction to Mathematical Portfolio Theory by Mark S. Joshi and Jane M. Paterson, CUP

Also useful are:

Modern Portfolio Theory and Investment Analysis by Edwin J. Elton, Martin J. Gruber, Stephen J. Brown, William N. Goetzmann, sixth or seventh edition;

Harry Markowitz, Portfolio Selection;

Harry Markowitz, Mean-Variance Analysis in Portfolio Choice and Capital Markets.

George Pennachi, Theory of Asset Pricing.

Learning Outcomes

Subject Objectives

By the end of the subject, students should be able to

- understand the objectives of Modern Portfolio Theory,
- define mean-variance efficiency,
• find efficient portfolios using Gaussian elimination,
• define and apply single- and multi-factor models for investment returns,
• use expected utility theory to make investment choices,
• use and critique the Capital Asset Pricing Model,
• find portfolio expected returns using the Arbitrage Pricing Theory,
• distinguish differing methodologies for making investment choices in terms of the strengths of their assumptions,
• make decisions regarding investment choice using a variety of mathematical techniques,
• discuss market efficiency and rationality,
• use stock price models across time to assess long-term risk in portfolios,
• give an actuary’s viewpoint on all these topics.

Awareness Issues
At a broader level, studying this subject will increase your awareness of issues such as:
• the role of mathematics in investment decisions,
• how to test a theory.

Subject Coordinator Contact Details
The coordinator and lecturer for this subject is Dr. Jane Paterson.

Jane Paterson:
Email: jjoshi@unimelb.edu.au
Room: Room 347, FBE Building
Consultation Hours: 1 to 2pm Tuesdays, by appointment if you have a lecture clash
Tutors

Dan Zhu, Chen Yang

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/.

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. Please ask questions using the online course tutor.

Lectures and Tutorials

Lectures

There will be 2 lectures a week. Additional lectures will occur in weeks 3, 6, 9 and 12. Consult the timetabling system for the times and locations. Slides will be available through the LMS. Lectures will be recorded using lecture capture. However, be aware that this is intended as a backup and is not 100% reliable.

Tutorials

Tutorials will take place in weeks 2 through 12. The questions will be taken from the textbook. The subset will be specified on the LMS. Solutions are in the textbook and additional material may be placed on the LMS. Please book your tutorials online.
Assessment

Assessment Overview

Your assessment for this subject comprises the following:

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Individual or Group</th>
<th>Due</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Assignments</td>
<td>Individual</td>
<td>To be announced</td>
<td>20%</td>
</tr>
<tr>
<td>End-of-semester exam</td>
<td>n/a</td>
<td>Assessment period</td>
<td>80%</td>
</tr>
</tbody>
</table>

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. If you have any issues, contact the student centre as soon as possible.

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.
Penalties for Late Submission and Exceeding Word Limits

In order to ensure equality for all students, assignments must be completed within specified time limits. Late submissions will attract a marking penalty where approval for late submission has not been 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. Contact the student centre as soon as possible.

Exemptions

The exemption for the CT8 module of the Institute of Actuaries exam will be based on the exam mark from this course and from exam marks in Advanced Financial Mathematics I. Exemption lists will be posted on the Centre’s website.