Mathematics of Finance II

SUBJECT GUIDE

Semester 2, 2013

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

Introduction

Welcome to Mathematics of Finance II. In this guide, we attempt to 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 divide an investment amongst many possible investment opportunities under the fundamental assumption that those investments are correctly priced.

Suggested References

Textbook is

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

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

Markowitz, Portfolio selection. The original book by the inventor of the field.

Markowitz, Mean-variance analysis in portfolio choice and capital markets.

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

Email: zjin@unimelb.edu.au
Room: 318, FBE Building
Phone: 8344 4655
Consultation Hours: 11:00 am to 12:00 pm Monday

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 also use the course discussion board and the online course tutor wherever possible.

**Lectures and Tutorials**

**Lecture Times**

- Monday 1:00pm - 2:00pm  Th: Old Arts-Theatre B 1 hour
- Thursday 11:00pm - 12:00pm  Th: Old Arts-Theatre B 1 hour

**Tutorials**

Tutorials will take place in weeks 2 through 12. The questions will be a subset of the specimen questions from the end of each lecture. The subset will be specified on the LMS. Solutions will be made available on the LMS.

- Monday 10:00am - 11:00am  Arts West-102 1 hour

**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>Assignment</td>
<td>n/a</td>
<td>To be announced</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-term</td>
<td>Individual</td>
<td>?</td>
<td>20%</td>
</tr>
<tr>
<td>End-of-semester exam</td>
<td>n/a</td>
<td>Assessment period</td>
<td>70%</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. See the Special Consideration website for more information: http://www.ecom.unimelb.edu.au/students/special/#missing

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 (e.g. 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.


The Teaching and Learning Unit has developed a web-based ‘Academic Honesty Module’ that allows you to learn more about and test your knowledge of plagiarism and collusion. You are strongly encouraged to complete this module, which can be accessed at: http://tlu.ecom.unimelb.edu.au/AcademicHonestyTest/index.cfm

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.

The following website contains detailed information relating to who can apply for Special Consideration and the process for making an application:

http://www.ecom.unimelb.edu.au/students/special/

Other Subject Resources

The following resources are provided to assist your learning:
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.

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 in The Spot, 198 Berkeley St. Please visit the TLU’s website – http://tlu.ecom.unimelb.edu.au/.

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

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 Mathematics of Finance III. Exemption lists will be posted on the Centre’s website.