Unit Outline*

FINA7463

Current Development in Derivative Securities

Semester 1, 2010
Crawley

Unit Coordinator: Dr Duy Tran

Business School

www.business.uwa.edu.au

*This Unit Outline should be read in conjunction with the Business School Unit Outline Supplement available on the Students web site http://www.business.uwa.edu.au/students
UNIT DESCRIPTION

Objectives

This is a continuous-time finance class for advanced honours or postgraduate students. The goal is to give you a solid mathematical and finance grounding in option pricing and term structure models in continuous time framework. This comprises a series of three-hour lectures. We will learn and understand the Brownian motion and stochastic integration before we study other important topics of continuous-time finance. We will use the book titled “Stochastic Calculus for finance II: Continuous Time Models”, 2004, by Steven Shreve for the course. Shreve’s first three chapters and the first part of chapter 4 build up the necessary material on stochastic processes.

Prerequisites

You should have taken FINA3306, Derivatives: Investment Strategies, or equivalent. You are expected to have good knowledge in probability theory, calculus, and adequate undergraduate knowledge in financial derivatives.

Main references


Other references

Paul Glasserman, Monte Carlo Methods in Financial Engineering
Salih N. Neftci, An Introduction to the Mathematics of Financial Derivatives
Marek Musiela and Marek Rutkowski, Martingale Methods in Financial Modelling
CONTACT DETAILS

We strongly advise students to regularly access their student email accounts. Important information regarding the unit is often communicated by email and will not be automatically forwarded to private email addresses.

<table>
<thead>
<tr>
<th>Unit coordinator/lecturer</th>
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<tbody>
<tr>
<td><strong>Name:</strong> Duy Tran</td>
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<tr>
<td><strong>Email:</strong> <a href="mailto:dtran@biz.uwa.edu.au">dtran@biz.uwa.edu.au</a></td>
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<td><strong>Phone:</strong> 6488 1821</td>
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<td><strong>Consultation hours:</strong></td>
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<td>Thursday, 2:00 – 3:00 pm</td>
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<td><strong>Lecture times:</strong></td>
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<td>Wednesday, 2:00 – 5:00 pm</td>
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<td><strong>Lecture venue:</strong></td>
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<td>2.42 - Case Study Room</td>
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Final Grades:

- Problem sets: 20%
- Midterm: 30%
- Final: 50%

Four problem sets with the highest scores out of six or seven ones will be used for the final grade. You can work together, but you have to write your own answers. The midterm and the final are closed book exams.

Proposed Details:

- **Week 1:** General Probability Theory, Ch1
- **Week 2:** Information and Conditioning, Ch2
- **Weeks 3-4:** Brownian Motion, Ch3
  Quadratic Variation, Ch3
- **Weeks 5-6:** Stochastic Calculus, Ch4
  Black-Scholes-Merton Equation, Ch4
- **Weeks 7:** Risk-Neutral Measure, Ch5
  Martingale Representation Theorem, Ch5
  Fundamental Theorems of Asset Pricing, Ch5
- **Week 8:** Midterm exam
Week 9-10: Dividend-Paying Stocks, Ch5  
Forwards and Futures, Ch5  
Connections with Partial Differential Equations, Ch6  
Change of Numeraire, Ch9

Week 11-12: Term Structure Models, Ch10  
Affine-Yield Models, Ch10  
Health-Jarrow-Morton Model, Ch10  
Forward LIBOR Model, Ch10

Week 13: Review, or Introduction to Jump Processes, or Monte Carlo Method,

**Charter of student rights**

This Charter of Student Rights upholds the fundamental rights of students who undertake their education at the University of Western Australia.

It recognises that excellence in teaching and learning requires students to be active participants in their educational experience. It upholds the ethos that in addition to the University’s role of awarding formal academic qualifications to students, the University must strive to instil in all students independent scholarly learning, critical judgement, academic integrity and ethical sensitivity.


**Collaboration & plagiarism**

You are encouraged to discuss among yourselves the work required for answering assignment questions, and to seek my help if required. However all work submitted for assessment must either be your own work, or it must be attributed if it is not your own work. Submitting work done by others as if it were your own is one form of plagiarism, a serious offence against UWA regulations. This includes the submission of assignment answers which are copies of some essentially original version. Refer to the relevant Faculty policy on this matter at the web address below.

**Calculators**

Only calculators with the faculty-approved sticker will be permitted for use in tests and the exam. Refer to the Faculty policy.

**Ethical scholarship, academic literacy and academic misconduct**

**Ethical scholarship** is the pursuit of scholarly enquiry marked by honesty and integrity.

**Academic Literacy** is the capacity to undertake study and research, and to communicate findings and knowledge, in a manner appropriate to the particular disciplinary conventions and scholarly standards expected at university level.
Academic misconduct is any activity or practice engaged in by a student that breaches explicit guidelines relating to the production of work for assessment, in a manner that compromises or defeats the purpose of that assessment. Students must not engage in academic misconduct. Any such activity undermines an ethos of ethical scholarship. Academic misconduct includes, but is not limited to cheating, or attempting to cheat, through:

- Collusion
- Inappropriate collaboration
- Plagiarism
- Misrepresenting or fabricating data or results or other assessable work
- Inappropriate electronic data sourcing/collection
- Breaching rules specified for the conduct of examinations in a way that may compromise or defeat the purposes of assessment.

Penalties for academic misconduct vary according to seriousness of the case, and may include the requirement to do further work or repeat work; deduction of marks; the award of zero marks for the assessment; failure of one or more units; suspension from a course of study; exclusion from the University, non-conferral of a degree, diploma or other award to which the student would otherwise have been entitled. Refer to the Ethical Scholarship, Academic Literacy and Academic Misconduct and individual Faculty policies.

Appeals against academic assessment

If students feel they have been unfairly assessed, they have the right to appeal their mark by submitting an Appeal Against Academic Assessment form to the Head of School and Faculty Office. The form must be submitted within twelve working days of the formal despatch of your unit assessment. It is recommended that students contact the Guild Education Officers to aid them in the appeals process. They can be contacted on +61 8 6488 2295 or education@guild.uwa.edu.au. Full regulations governing appeals procedures are available in the University Handbook, available online at http://www.publishing.uwa.edu.au/handbooks/interfaculty/PFAAAA.html.

Student Guild

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