

School of Economics and Finance
FINA 403 Derivative Securities

Trimester 1 2011

COURSE OUTLINE

Names and Contact Details

Lecturer and Coordinator: Toby Daglish, RH309, phone 463-5451,
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Trimester Dates

Teaching Period: Monday 28 February – Friday 3rd June

Study Period: Monday 6 June – Thursday 9 June

Examination Period: Friday 10 June – Saturday 2 July (inclusive)

Class times and Room numbers

Tuesday 13:40 – 15:30 RWW128

Withdrawal from the course

Your fees will be refunded if you withdraw from this course on or before 11 March 2011.

The standard last date for withdrawal from this course is 14 May 2011. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on the form 'Application for Associate Dean's permission to Withdraw Late', and include supporting documentation. This form is available from the Faculty's Student Customer Service Desks.

Course delivery

The course is composed of 11 lectures.

Course content

The following is the timetable for the course, with suggested readings for each section. The readings are fairly extensive, but hopefully should give you plenty of alternative explanations of the material covered in lectures.

Date	Lecture	Readings
March 1	Introduction to derivatives.	H, chapters 1-2,5,8,10. WHD, chapter 1.
March 8	Stochastic Calculus.	H, chapter 12. WHD, chapter 2. BR sections 3.1-3.3.
March 15	Risk-Neutral Valuation: PDE Approach. <i>Assignment 1 due.</i>	H, chapter 13. WHD, chapters 3-5.
March 22	Risk-Neutral Valuation: Martingale Approach.	BR, chapters 1-3.
March 29	Dividends and Options on different securities.	H, chapter 14. WHD, chapter 6. BR, chapter 4
April 5	Dividends and Options on different securities, cont'd <i>Assignment 2 due.</i>	
April 12	Numerical Methods: Finite Difference Methods.	H, chapter 17. WHD, chapters 8-10.
May 3	<i>Midterm Exam</i>	
May 10	Numerical Methods: Monte Carlo Simulation.	H, chapter 17.
May 17	Stochastic Volatility. <i>Case due.</i>	–
May 24	Fixed income derivatives.	H, chapters 4, 28-29. WHD, chapter 17. BR, chapter 5. C, chapter 4.
May 31	Fixed income derivatives, cont'd <i>Assignment 3 due.</i>	

Course Learning Objectives

By the end of this course, students should be able to:

- C1 Understand stochastic calculus, and use Ito's lemma to solve option pricing problems.
- C2 Apply the partial differential equation and martingale approaches to option pricing (including being able to derive the Black-Scholes formula).
- C3 Use finite difference and Monte Carlo techniques to price options where a closed form solution does not exist.
- C4 Hedge options and evaluate Value at Risk for portfolios of stocks and derivatives.
- C5 Appreciate the general problem of pricing fixed income securities.
- C6 Use the Vasicek and Cox-Ingersoll-Ross models for the short rate to price coupon bonds, and the Vasicek model to price options on coupon bonds.

Readings

Readings will be taken from a variety of sources. Probably the most used reference on this material is :

- J. Hull, "Options, Futures and Other Derivatives", Prentice Hall, 6th edition. [H]

However, for some of the topics, we will find the following books useful:

- M. Baxter and A. Rennie, "Financial Calculus: An introduction to derivative pricing", Cambridge, First edition. [BR]
- P. Wilmott, S. Howison and J. Dewynne, "The Mathematics of Financial Derivatives: A Student Introduction", Cambridge, First edition. [WHD]
- A. J. G. Cairns, "Interest Rate Models: An Introduction", Princeton, First edition. [C]

Expected workload

Expected workload for this course is 150 hours. 22 hours of lectures, 4 hours of exams and 124 hours of study/work on assignments.

Materials and Equipment

Non-programmable calculators are required for the midterm and final exams.

Assessment Requirements

Your course mark will be a weighted average, made up as follows:

Assignment 1:	5%	due March 15.
Assignment 2:	5%	due April 5.
Midterm exam:	35%	on May 3 (during regular class time).
Live case:	15%	due May 17.
Assignment 3:	5%	due May 31.
Final exam:	35%	two hours, date will be scheduled during the university examination period.

The assignments will contain problems similar to those which will be found in the exam, while the live case will allow you to use some of the tools from the course to tackle a realistic options pricing problem using actual market data.

Note: Your assessed work may also be used for quality assurance purposes, such as to assess the level of achievement of learning objectives as required for accreditation and audit purposes. The findings may be used to inform changes aimed at improving the quality of FCA programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

Penalties

Assignments and cases are due at the start of the lecture indicated. Assignments and cases handed in late will not be marked.

Examinations

Students who enrol in courses with examinations are obliged to attend an examination at the University at any time during the formal examination period. The final examination for this course will be scheduled at some time during the period from Friday 10 June Saturday 2 July 2011.

Mandatory course requirements

None.

Communication of additional information

Information on the course, including assignments and lecture notes, will be distributed via blackboard, which can be found at <http://blackboard.vuw.ac.nz/>.

Class representative

A class representative will be elected in the first class, and that persons name and contact details made available to VUWSA, the Course Coordinator and the class. The class representative provides a communication channel to liaise with the Course Coordinator on behalf of students.

Notice of Turnitin Use

Student work provided for assessment in this course may be checked for academic integrity by the electronic search engine <http://www.turnitin.com>. Turnitin is an on-line plagiarism prevention tool which identifies material that may have been copied from other sources including the Internet, books, journals, periodicals or the work of other students. Turnitin is used to assist academic staff in detecting misreferencing, misquotation, and the inclusion of unattributed material, which may be forms of cheating or plagiarism. At the discretion of the Head of School, handwritten work may be copy typed by the School and subject to checking by Turnitin. You are strongly advised to check with your tutor or the course coordinator if you are uncertain about how to use and cite material from other sources. Turnitin will retain a copy of submitted materials on behalf of the University for detection of future plagiarism, but access to the full text of submissions will not be made available to any other party.

SUPPLEMENTARY INFORMATION

For the following important information follow the links provided:

Academic Integrity and Plagiarism <http://www.victoria.ac.nz/home/study/plagiarism.aspx>

General University Policies and Statutes Find key dates, explanations of grades and other useful information at

www.victoria.ac.nz/home/study.

Find out about academic progress and restricted enrolment at

www.victoria.ac.nz/home/study/academic-progress.

The Universitys statutes and policies are available at

www.victoria.ac.nz/home/about/policy, except qualification statutes, which are available via the Calendar webpage at www.victoria.ac.nz/home/study/calendar (See Section C).

Further information about the Universitys academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at

www.victoria.ac.nz/home/about_victoria/avcacademic/default.aspx

AVC (Academic) Website: information including: Conduct, Academic Grievances, Students with Impairments, Student Support

http://www.victoria.ac.nz/home/about_victoria/avcacademic/Publications.aspx

Faculty of Commerce and Administration Offices

<http://www.victoria.ac.nz/fca/studenthelp/>

Manaaki Pihipihinga Programme
http://www.victoria.ac.nz/st_services/mentoring/