TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI

VICTORIA
UNIVERSITY OF WELLINGTON

School of Economics and Finance

FINA 403 DERIVATIVE SECURITIES

Trimester 2, 2015

COURSE OUTLINE

Names and Contact Details
Graeme Guthrie (course coordinator)
Room RH 326
Tel.   (04) 463-5763
Email: graeme.guthrie@vuw.ac.nz

Trimester Dates
Teaching Period   Monday July 13 – Friday October 16
Study Period   Monday October 19 – Thursday October 22
Examination Period   Friday October 23 – Saturday November 14 (inclusive)

Withdrawal from Course
1. Your fees will be refunded if you withdraw from this course on or before Friday July 24, 2015.
2. The standard last date for withdrawal from this course is Friday September 25, 2015. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on an 'Application for Associate Dean's Permission to Withdraw Late' form including supporting documentation. The application form is available from either of the Faculty's Student Customer Service Desks or online.

Class Times and Room Numbers
Lectures   Tuesday   15:40-17:30   RWW128

Group Work
None

Expected Workload
The workload for FINA 403 is intended to be similar to that for other 400-level ECON and FINA courses. The total expected workload is 150 hours.

Prescription
An intensive examination of the pricing of options and option-like assets and their use in hedging financial risk. Topics include stochastic calculus, risk-neutral valuation, finite difference methods, Monte Carlo simulation, and fixed income derivatives.

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

- Demonstrate understanding of stochastic calculus, estimate Ito processes' underlying parameters, and use Ito's lemma
- Derive the partial differential equations that determine derivative prices
- Use risk-neutral pricing to value derivative securities
- Use finite difference and Monte Carlo techniques to price derivative securities
- Hedge and replicate derivative securities using portfolios of stocks and bonds

Course Content

Topic 1: Introduction Derivative securities. Arbitrage.

Topic 2: Stochastic Calculus Wiener processes. Ito processes. Examples. Ito's Lemma. Estimation of Ito processes.

Topic 3: Risk-Neutral Pricing Hedging portfolio. Fundamental pricing equation. Risk-neutral pricing. Black-Scholes formula. Delta hedging. Discrete rebalancing. Gamma hedging.

Topic 4: Dividends Hedging portfolio. Fundamental pricing equation. Risk-neutral pricing. Options on stock indices. Currency derivatives. Options on futures.

Topic 5: Monte Carlo Simulation Black-Scholes revisited. Central Limit Theorem. Measuring efficiency. Antithetic variates method. Control variate method. Using the Euler approximation. Path-dependent securities.

Topic 6: Finite Difference Methods Finite differences. Explicit method. Implicit method. Crank-Nicholson method.

Topic 7: Early Exercise Opportunities Exercise strategies. Bermudan options. Dynamic programming. American options. Compound options.

Topic 8: Application to Real Options (if time permits).

Readings

There is no set textbook for this course as comprehensive lecture notes will be available from http://blackboard.vuw.ac.nz/.

Materials and Equipment

None.

Assessment

The final grade will be determined by three assignments (contributing 40% in total) and a two-hour final exam (covering the whole course and contributing 60%). The assignment due dates are

- Assignment 1 (8%): 15:40 on Tuesday, August 4 (start of lecture 4).
- Assignment 2 (16%): 15:40 on Tuesday, September 15 (start of lecture 8).
- Assignment 3 (16%): 15:40 on Tuesday, October 13 (start of lecture 12).

The Assessment Handbook will apply to all VUW courses: see http://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf.

Penalties

Assignments handed in late will not be marked. If a satisfactory medical certificate is provided, the weight from the assignment will be shifted onto the other pieces of assessment; otherwise, the assignment score will be recorded as 0.

Use of Turnitin

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 compares submitted work with a very large database of existing material. At the discretion of the Head of School, handwritten work may be copy-typed by the School and submitted to Turnitin.

A copy of submitted materials will be retained 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.

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 following period:

Friday October 23 – Saturday November 14 (inclusive)

Mandatory Course Requirements
In addition to obtaining an overall course mark of 50% or better, students must score at least 50% on the final exam.

If you cannot complete an assignment or sit a test or examination, refer to
www.victoria.ac.nz/home/study/exams-and-assessments/aegrotat

Class Representative
A class representative will be elected in the first class, and that person's 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.

Communication of Additional Information
Course documents and other information will be available on the course website at http://blackboard.vuw.ac.nz. Announcements will also be posted there.

Student feedback
Student feedback on University courses may be found at
www.cad.vuw.ac.nz/feedback/feedback_display.php

Link to general information
For general information about course-related matters, go to
http://www.victoria.ac.nz/vbs/studenthelp/general-course-information

Note to Students
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 academic audit. The findings may be used to inform changes aimed at improving the quality of VBS programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

****