School of Economics and Finance

MMAF 533

SPECIAL TOPIC: FIXED INCOME SECURITIES

Trimester 2, 2011

COURSE OUTLINE

Coordinator/Lecturer   Leigh Roberts, RH 323, phone 463 5937
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Administrator   Anna Potts, RH 307, phone 463 6148
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Lecture times   Monday 11.30 - 1.20, RWW 128

The coordinator is generally available in his office on Wednesday mornings for discussions on the course, or dealing with problems arising from the course.

Trimester dates

Teaching Period: Monday 11 July to Friday 14 October 2011
Study Period: Monday 17 October to Thursday 20 October 2011
Examination Period: Friday 21 October to Saturday 12 November 2011 (inclusive)

Note: Students who enrol in courses with examinations should be able to attend an examination at the University at any time during the formal examination period.

Withdrawal from the course

Your fees will be refunded if you withdraw from this course on or before **22 July 2011**.

The standard last date for withdrawal from this course is the three-quarter point of the teaching period, viz. **Friday 23 September 2011**. After this date, students wishing to withdraw due to circumstances beyond their control require the consent of the Associate Dean (Students).

To apply for permission to withdraw late, fill in the 'Application for Associate Dean's permission to Withdraw Late' form available from either of the Faculty's Student Customer Service Desks, and include supporting documentation.

Course Learning Objectives

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

- exhibit a sound comprehension of the yield curve and interest rate functions derived therefrom.
- exhibit a sound comprehension of the elements of stochastic calculus and its applications utilising interest rate models.
- exhibit a sound comprehension of the applications of stochastic calculus to pricing and analysis of fixed income and related securities.
- apply financial mathematical tools to pricing and analysis of fixed income derivatives depending on joint survivorship, modelled using copulas.
- apply finite difference and Monte Carlo techniques to analysis and pricing of financial securities.
- evaluate credit risk models in wide current usage; and apply financial mathematical tools to credit risk analysis and modelling, using asset swaps and credit spreads.
- realise the potential of, as well as the limitations of, quantitative models and methodologies in dealing with interest rate and credit risk.
- place financial mathematics principles within the framework of financial risk management in general, and financial engineering and credit risk in particular.

The course learning objectives apply to all sections of the course and are subject to testing in each item of assessment.

Course Content

The course is divided into three main parts, viz.:

- Fixed income modelling (6-8 weeks);
- Credit risk (2-3 weeks); and
- Firm time to default (2-3 weeks)

The teaching sequence does not necessarily follow this order; and the timing shown is only approximate.

Course Delivery

One two hour lecture per week for 12 weeks.

Expected Workload

It is expected that the course will require approximately 200 hours of work, including class time.

Readings

Notes and readings will be made available, generally on Blackboard although sometimes in class.

It is *not* recommended that you purchase any text books for this course. Books which may be useful for parts of the course, however, include:

- M. Baxter and A. Rennie (1996), *Financial Calculus: an Introduction to Derivative Pricing*. Cambridge University Press.
- A. G. J. Cairns (2004), *Interest rate models: an introduction*. Princeton University Press.
- J. C. Hull (2000), *Options, Futures and other Derivatives*, fourth edition. Prentice Hall.
- J. C. Hull (2006), *Options, Futures and other Derivatives*, sixth edition. Pearson Prentice Hall.
- J. C. Hull (2007), *Risk Management and Financial Institutions*. Pearson Prentice Hall.
- L. Martellini and P. Priaulet (2001), *Fixed-Income Securities*. Wiley.
- A. J. McNeil, R. Frey and P. Embrechts (2005), *Quantitative Risk Management*. Princeton University Press.
- P. J. Schönbucher (2003), *Credit Derivatives Pricing Models*. Wiley.

The preferred computing environment for the course is the statistical package R, available in student labs and also as open-source freeware from the internet. The requirement to use R may however be waived for individual students, at the coordinator's discretion.

A calculator is required, with the capacity to evaluate powers, exponentials and logarithms. A basic calculator suitable for the course costs about \$20.

Assessment

- 40% Three hour final examination, during the period
        21 October - 12 November 2011.
- 15% Minor project of approximately 1000 words, due halfway through the course.
- 30% Major project of approximately 4000-5000 words, due at the end of week 11.
- 15% Weighted average mark for four assignments.

The due date for the minor project will be fixed in consulation with the class no later than week 3 of the course. It is intended that the minor project be on a topic similar to that of the major project, and will lead into the major project. It is anticipated that the projects will involve programming in R.

Provided the student has good reason (for instance a medical certificate), and obtains permission *before* the due date from the coordinator, there will be no penalty for handing in a project or assignment late. In other cases the project or assignment will first be graded on a basis comparable with those assignments handed in on time, and then have 5% of that grade subtracted for each day or part-day for which the assignment is late. Projects of length outside the recommended limits may be penalised.

A project or assignment is expected to be written *entirely* by the student. In cases where there is any doubt in the marker's mind as to whether the assignment is entirely the student's own work, the coordinator reserves the right to withhold the mark until the situation has been clarified.

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 purposes will be treated as confidential, and the outcome will not affect your grade for the course.

Mandatory course requirements

Submission of the major project is compulsory; and in order to pass the course, it is necessary to obtain at least 40% in the final examination.

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 coordinator and the class. The class representative provides a communication channel to liaise with the coordinator on behalf of students.

Communication of additional information

Additional information will be conveyed to students via Blackboard and/or email.

Emails may be sent to the address that you supplied with your enrolment; but they may also be sent to your SCS email address, which is your official university email

address. You should look at both email addresses on a regular basis.

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 my be copy-typed by the School and subject to checking by Turnitin. 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.

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
http://www.victoria.ac.nz/home/study
Find out about academic progress and restricted enrolment at
http://www.victoria.ac.nz/home/study/academic-progress.aspx
The University's statutes and policies are available at
http://www.victoria.ac.nz/home/about/policy
except qualification statutes, which are available via the Calendar webpage at
http://www.victoria.ac.nz/home/study/calendar.aspx   (See Section C).

Further Information
Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at
http://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/

Te Putahi Atawhai
Maori and Pacific Mentoring Programme
http://www.victoria.ac.nz/st_services/tpa/index.aspx