TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI

VICTORIA
UNIVERSITY OF WELLINGTON

VICTORIA INTERNATIONAL APPLIED FINANCE PROGRAMME
School of Economics and Finance

MMAF525   FINANCIAL MODELLING
Trimester One 2009

COURSE OUTLINE

Contact Details

The course coordinator is Joe Cheung. Joe is based in Auckland and therefore the preferred contact is by Blackboard (http://blackboard.vuw.ac.nz/) or email. The email address is: jcheung@xtra.co.nz.

Block Release Times

Block 1   9:00am Saturday 18th April – 12:00pm Monday, 20th April, 2009
Block 2   9:00am Saturday 6th June – 12:00pm Monday 8th June, 2009

A detailed schedule of each block release will be supplied closer to the April and June sessions. **Attendance for all sessions of both block releases is compulsory.**

Course Learning Objectives

This course is designed to provide students with the knowledge of building financial models in Excel. The aim is to bridge the gap between theory and practice.

To achieve this goal, students will:
- Learn and demonstrate basic programming and modelling skills in Excel and in VBA.
- Apply these skills in the construction of financial models based on materials that are covered in various other courses offered in the VIAF programme.

Modelling skills acquired in this course should provide participants with the tools and confidence for building their own models to tackle most problems in finance.

Pre-requisite Skills

Prior knowledge in VBA programming is neither required nor assumed. However, it is required that participants have intermediate level Excel skills before taking this course. It is most likely that you would have already met this requirement if you have been using Excel on a regular basis. However, if you are a new Excel user or your Excel skills are at the beginner's level, it is essential that you acquire some basic Excel skills on your own before the course starts. There are many introductory Excel books that are available on most bookstores which you might find useful. For instance, a good reference book is:

"Excel 2003 Bible" by John Walkenbach, Wiley.

(Note that we will be using Excel 2003 in this course and NOT Excel 2007.)

> **While students are not required to have prior programming experience, this course does involve a substantial amount of writing and reading VBA codes. This could be a highly frustrating and time-consuming experience for some. It is strongly recommended that you consider very carefully whether you are prepared to invest a significant amount of time in learning advanced Excel modelling skills before deciding to enrol in this course.**

Course Content
First session (18th April – 20th April): Introduction to VBA and Applications in Finance

A: Materials to be covered

The main objective of this session is to introduce students to VBA programming and basic modelling skills in Excel. These skills will be applied to build some simple models in Finance.

VBA skills:
- Object oriented programming approach and the VBA programming environment
- Variable Declaration and Variable Types
- Range Objects and Properties
- Basic VBA Language Structures
- Arrays and Dynamic Arrays
- Writing Simple Functions
- Array Functions and Writing Array Functions
- Improving Presentation with Charts and Subroutines

Applications in Finance:
- Financial arithmetic calculations with user-defined functions
- Term structure of interest rate problems such as deriving a zero-coupon yield curve, curve fitting and simple term structure modelling
- Prices and return distributions of financial assets
- Simulation
- Value at risk and bootstrapping methods

(Examples from these Finance applications should give you a head start on the course project that involves designing a financial model of your own - see details below.)

B: Readings

1. Text: John Simon Benninga, Financial Modelling, 3nd edition, the MIT Press.

Textbook chapter(s)	Topic
30, 33, 34, 35	Excel functions, arrays and other useful features
36, 37, 38, 39, 40	User-defined functions, VBA loop structures, macros and user interaction, arrays
1	Financial calculations
27	Modelling the term structure
18	Lognormal distribution and simulations

15	Value at risk and bootstrapping

2. Supplementary notes on Excel and VBA (these are distributed along with this course outline).

Second session (6th June – 8th June): Building More Advanced Models in Finance

A: Materials to be covered

The objective of this session is to extend the VBA modelling skills developed in the first session and apply them to a selection of Finance topics. These topics include option valuation, company/stock valuation models, portfolio optimisation, duration, immunisation and default-adjusted expected bond returns.

B: Readings

Text: John Simon Benninga, Financial Modelling, 2nd edition, the MIT Press.

Textbook chapter(s)	Topic
16, 19	Option valuation
2, 3, 4	Company/stock valuation
8, 9, 10.1-10.6, 12	Portfolio selection
25, 26	Duration and immunisation
28	Default-adjusted expected bond returns

C: Course Project

A key learning outcome of this course is students' ability to build an Excel model to solve practical problems in Finance. The course project is therefore an integral and important part of the assessment process. The 25 percent weight being allocated to the course project is a reflection of its importance.

Please note that the course project is an individual assignment and NOT a group project. As such, you must develop your own Excel model to tackle some finance problem(s) of your choice. In general, a model will consist of a set of inputs, a processing module and a set of outputs (tables, graphs, etc.). Also, as a general rule, a financial model should be designed in such a way that it can readily accommodate a sensitivity analysis of the results, i.e. the model should allow assessments of how changes in values of input variables can affect the model outputs (values, profits, losses, etc). You are expected to apply materials and techniques covered in this course to build the model.

You can develop a financial model that is work-related. However, you should use a set of made up data in the model for reason of confidentiality. If you would like to get some advance feedback on your ideas about the project, you can also hand in a one-page proposal of your project when you submit Assignment 2, but this is not mandatory.

When you hand in your project, attach a brief user-guide or summary that highlights all the features in your model to ensure that these features in the model will be given proper considerations.

Assessment Criteria

The course project will be assessed using the following criteria:

1) *Problem definition.* Is the problem that the model is trying to solve well defined? (You could include a description in your model to explain the problem and how your model is structured to solve the problem.)

2) *Model integrity.* Are there many errors in the model? Does the model break down when different input values are used?

3) *Modelling techniques/skills.* Are the techniques used appropriate for the problem? Is the model built in a proficient manner? Has the model incorporated skills/techniques covered in the course?

4) *Presentation.* Is the model easy to use and follow? Does the model look professional?

5) Level of difficulty. This criterion is included to discourage attempts to trivialise the exercise rather than to encourage the choice of difficult problems. Most models that are developed as a result of a genuine attempt to solve a financial problem will not have marks added or deducted under this criterion. However, there will be a heavy penalty for models that are trivial and require minimal efforts to complete.

In order to maintain the integrity of the course project, an interview on the project may be conducted to ascertain whether the project is a result of your own work. During the interview, questions related to various aspects of the project will be asked to ascertain that you have sufficient knowledge and skills to have completed the project on your own. Any such interview will be notified and arranged in advance. Moreover, since this is an individual assignment and not a group project, a zero mark may be awarded to any slightly modified version of the same model submitted by another student.

Expected Workload

	Activity type	Number of hours
Weeks (12) outside block release		
	Readings/studying	100 hours
	Assignments	25 hours
	Project	25 hours
Two block releases		
	Lectures/tests	40 hours
	Studying	10 hours

Textbooks & Readings

Simon Benninga, <u>Financial Modelling</u>, 3rd edition, the MIT Press.

There is also a set of supplementary notes for the first session.

Assessment Requirements

To pass, a student must obtain an average mark of at least 50% over all course assessments. In addition, a student must also achieve a minimum of a 45% average in the two tests. Assessments include two assignments, one course project and two tests.

The first assignment will consist of 3 sets of VBA exercises/tasks. It is primarily a tool to get students started on learning VBA before the first session. The assignment may require a substantial amount of time to complete, but by design each set of exercises will carry only 2%

of the total marks. This is to encourage students to learn the materials themselves without collaborations and at the same time not having to worry too much about the effect these exercises might have on the final grade. It is important that you do not collaborate with other participants in doing these exercises. You need to acquire the basic programming skills in order to tackle more interesting and challenging tasks later on. A set of VBA notes will accompany these exercises.

The second assignment will consist of exercises related to the materials in the block releases. This will be handed out in the first block release.

The first and second tests will be 2 ½ hours long each, and held at the end of each block release in the computer lab. Marks will be allocated as follows:

Tests: One test at each block release session based on reading
                assigned for period leading up to the block release and
                material presented at the block release (at 30% each)   60%

Assignments: Assignment 1 (3 sets of exercises at 3% each)   9%
                Assignment 2   6%
                Course Project (discussed above)   25%
                                                                        _____
Total Assessment: 100%

 The due dates for the assignment and the project are listed below:
                Assignment 1 (a)   Fri 27 March 2008
                Assignment 1 (b)   Fri 3 April 2008
                Assignment 1 (c)   Thu 9 April 2008
                Assignment 2   Fri 22 May 2008
                Course project   Mon 22 June 2008

All assignments must be submitted via the Digital Drop Box function on Blackboard. (http://blackboard.vuw.ac.nz/)

Penalties
Marks for each assignment will diminish by 5% for every day late, with a weekend counting as one day. The date of submission or the day of postmark (if by post) shall be taken as the date of delivery. There will be a final cut off date, which is one week after the due date for each assignment, after which no assignment can be accepted.

Mandatory Course Requirements
To pass, a student must: (i) attend all sessions of both block release courses; (ii) achieve a minimum of a 45% average in the two tests.

Communication of Additional Information
Additional information including assignment questions, details of the block course schedule, feedback on course assessments, etc will be provided primarily via Blackboard (http://blackboard.vuw.ac.nz/) and possibly also by email and post. Students are responsible for ensuring that the VIAF administrator, (email: viaf-programme@vuw.ac.nz), has their up to date email and postal addresses, as well as ensuring your details are correct on Student Records.

If you have, or become aware of, any health condition that could prevent you attending a VIAF compulsory block release, then you should notify the Programme director immediately, preferably by email, dawn.lorimer@vuw.ac.nz.

Faculty of Commerce and Administration Offices

Railway West Wing (RWW) - FCA Student and Academic Services Office

The Faculty's Student and Academic Services Office is located on the ground and first floors of the Railway West Wing. The ground floor counter is the first point of contact for general enquiries and FCA forms. Student Administration Advisers are available to discuss course status and give further advice about FCA qualifications. To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

Easterfield (EA) - FCA/Education/Law Kelburn Office

The Kelburn Campus Office for the Faculties of Commerce and Administration, Education and Law is situated in the Easterfield Building first floor. The office is available for the following:
- Duty tutors for student contact and advice.
- Information concerning administrative and academic matters.
- Forms for FCA Student and Academic Services (e.g. application for academic transcripts, requests for degree audit, COP requests).
- Examinations-related information during the examination period.

To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

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 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.

General University Policies and Statutes

Students should familiarise themselves with the University's policies and statutes, particularly the Assessment Statute, the Personal Courses of Study Statute, the Statute on Student Conduct and any statutes relating to the particular qualifications being studied; see the Victoria University Calendar available in hard copy or on the VUW website at
http://www.victoria.ac.nz/home/study/calendar.aspx

Student and Staff Conduct

The Statute on Student Conduct together with the Policy on Staff Conduct ensure that members of the University community are able to work, learn, study and participate in the academic and social aspects of the University's life in an atmosphere of safety and respect. The Statute on Student Conduct contains information on what conduct is prohibited and what

steps are to be taken if there is a complaint. For information queries about complaint procedures under the Statute on Student Conduct, contact the Facilitator and Disputes Advisor or refer to the statute on the VUW policy website at:
www.victoria.ac.nz/home/about/policy/students.aspx
The Policy on Staff Conduct can be found on the VUW website at:
www.victoria.ac.nz/home/about/policy/staff.aspx

Academic Grievances
If you have any academic problems with your course you should talk to the tutor or lecturer concerned; class representatives may be able to help you in this. If you are not satisfied with the result of that meeting, see the Head of School or the relevant Associate Dean; the VUWSA Education Coordinator is available to assist in this process. If, after trying the above channels, you are still unsatisfied, formal grievance procedures can be invoked. These are set out in the Academic Grievance Policy which is published on the VUW website at:
www.victoria.ac.nz/home/about/policy/students.aspx

Academic Integrity and Plagiarism
Academic integrity is about honesty – put simply it means *no cheating*. All members of the University community are responsible for upholding academic integrity, which means staff and students are expected to behave honestly, fairly and with respect for others at all times. Plagiarism is a form of cheating which undermines academic integrity. The University defines plagiarism as follows:
The presentation of the work of another person or other persons as if it were one's own, whether intended or not. This includes published or unpublished work, material on the Internet and the work of other students or staff.
It is still plagiarism even if you re-structure the material or present it in your own style or words.
Note: It is however, perfectly acceptable to include the work of others as long as that is acknowledged by appropriate referencing.

Plagiarism is prohibited at Victoria and is not worth the risk. Any enrolled student found guilty of plagiarism will be subject to disciplinary procedures under the Statute on Student Conduct and may be penalized severely. Consequences of being found guilty of plagiarism can include:
- an oral or written warning
- cancellation of your mark for an assessment or a fail grade for the course
- suspension from the course or the University.
Find out more about plagiarism, and how to avoid it, on the University's website:
www.vuw.ac.nz/home/studying/plagiarism.html

Students with Impairments (see Appendix 3 of the Assessment Handbook)
The University has a policy of reasonable accommodation of the needs of students with disabilities. The policy aims to give students with disabilities the same opportunity as other students to demonstrate their abilities. If you have a disability, impairment or chronic medical condition (temporary, permanent or recurring) that may impact on your ability to participate, learn and/or achieve in lectures and tutorials or in meeting the course requirements, please contact the course coordinator as early in the course as possible. Alternatively, you may wish to approach a Student Adviser from Disability Support Services (DSS) to discuss your individual needs and the available options and support on a confidential basis. DSS are located on Level 1, Robert Stout Building:

telephone: 463-6070
email: *disability@vuw.ac.nz*

The name of your School's Disability Liaison Person is in the relevant prospectus or can be obtained from the School Office or DSS.

Student Support

Staff at Victoria want students to have positive learning experiences at the University. Each faculty has a designated staff member who can either help you directly if your academic progress is causing you concern, or quickly put you in contact with someone who can. Assistance for specific groups is also available from the Kaiwawao Maori, Manaaki Pihipihinga or Victoria International.

In addition, the Student Services Group (email: *student-services@vuw.ac.nz*) is available to provide a variety of support and services. Find out more at:
www.victoria.ac.nz/st_services/

VUWSA employs an Education Coordinator who deals with academic problems and provides support, advice and advocacy services, as well as organising class representatives and faculty delegates. The Education Office (tel. 463-6983 or 463-6984, email at *education@vuwsa.org.nz*) is located on the ground floor, Student Union Building.

Manaaki Pihipihinga Programme

Manaaki Pihipihinga is an academic mentoring programme for undergraduate Māori and Pacific students in the Faculties of Commerce and Administration, and Humanities and Social Sciences. Sessions are held at the Kelburn and Pipitea Campuses in the Mentoring Rooms, 14 Kelburn Parade (back courtyard), Room 109D, and Room 210, Level 2, Railway West Wing. There is also a Pacific Support Coordinator who assists Pacific students by linking them to the services and support they need while studying at Victoria. Another feature of the programme is a support network for Postgraduate students with links to Postgraduate workshops and activities around Campus.

For further information, or to register with the programme, email *manaaki-pihipihinga-programme@vuw.ac.nz* or phone (04) 463 6015. To contact the Pacific Support Coordinator, email *pacific-support-coord@vuw.ac.nz* or phone (04) 463 5842.