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 2010

COURSE OUTLINE

Name and Contact Details

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

Block Release Times

Block 1 9:00am Saturday 10th April – 12:30pm Monday, 12th April, 2010
Block 2 9:00am Saturday 12th June – 12:30pm Monday 14th June, 2010

The trimester dates are from 1st March 2010 to 6th June 2010. The study/examination period is from 7th – 30th June 2010, and, as well as the block course, assignments may be scheduled during this time.

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.**

Withdrawal from Courses:

Information available via

> **Withdrawal dates: Late withdrawals with Associate Dean (Students) permission (See Section 8: Withdrawals - from the Personal Courses of Study Statute)**
> http://policy.vuw.ac.nz/Amphora!~~policy.vuw.ac.nz~POLICY~000000001743.pdf
>
> **Withdrawal dates: refunds:**
> http://www.victoria.ac.nz/home/admisenrol/payments/withdrawlsrefunds.aspx

Class Venue

Kirk Building Computer Lab KK216

Course Learning Objectives

This course is designed to provide students with the knowledge of building financial models in Excel. The goal is to bridge the gap between theory and practice. To achieve this goal, students will learn basic programming and modelling skills in Excel and in VBA. These skills will then be applied to build models based on materials that are covered in various courses offered in the VIAF programme. Modelling skills acquired in this course should provide participants with the tools and confidence in building their own models to tackle problems encountered in finance.

Course Content

First session (10th April – 12th 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 a number of basic 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
- Price and return distributions of financial assets
- Simulation
- Value at risk and bootstrapping methods

B: Readings

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

Textbook chapter(s)	*Topic*
30, 31, 33, 34, 35	Excel functions, arrays/matrices 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 (12th June – 14th 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, 3rd 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

Course Project

A key learning outcome of this course is to ensure students are capable of building an Excel model to solve practical problems in Finance. The course project is therefore an integral and important part of the assessment process. The 28 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. Therefore, you must develop your own Excel model. In general, a model will consist of a set of inputs, a processing module and a set of outputs (tables, graphs, etc.). In general, a financial model should be designed in such a way that it can readily accommodate a 'what-if' analysis, i.e. the model should allow assessments of how changes in values of inputs can affect the model outputs (values, profits, losses, etc). You are expected to apply modelling skills covered in this course to build the model. You can also develop a financial model that is work-related. In this case, you should use a set of 'made-up' data in the model for reasons of confidentiality.

If you would like to get some advance feedback on your ideas about the project, you can choose to hand in a one-page proposal of your project when you submit Assignment 2. However, this is not mandatory.

When you hand in your final project, attach a brief summary that highlights all the features in your model to ensure that all your efforts will be given proper considerations.

Course Delivery

The course will be delivered in two block releases. Students are expected to complete all readings, exercises and assignments before each block release. Intensive examples of a number of financial models covering various topics in Finance will be covered in each block release. There will be a compulsory 3-hour test at the end of each block release.

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.

Note that we will be using Excel 2007 in this course. The computer lab at Victoria University will only have Excel 2007 installed and therefore you will need to sit the tests in Excel 2007. Since it will take some time (even if you are a proficient user of previous versions of Excel) for you to be familiar with Excel 2007, it is necessary that you have access to Excel 2007 and use Excel 2007 in completing all the assignments.

There are many introductory Excel 2007 books that are available in bookstores which you might find useful. For example, two good reference books would be:

- "Using Microsoft Office Excel 2007" by Bill Jelen, Que.
- "Excel 2007 Bible" by John Wakenbach, Wiley.

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 time-consuming and frustrating 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 taking this course.

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

Textbook & Reading Materials

- Simon Benninga, Financial Modelling, 3rd edition, the MIT Press.
- Supplementary notes for the first session.
- Introductory books on Excel 2007 (if required).

Materials and Equipment

Students need to obtain a copy of the Excel 2007 software in order to study for this course. All assignments, class examples and tests will be based on Excel 2007. The tests will be open-book and you will be asked to answer the test questions in Excel 2007 in the computer lab. If you are not familiar with using Excel 2007, you might also need to purchase an introductory book on Excel 2007 for reference at your own expense.

Assessment Requirements

Assessment items in this course include two assignments, one course project and two tests. 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.**

The first assignment will consist of 2 sets of VBA exercises. It is primarily a tool to get you started on learning VBA before the first session. The assignment may require a substantial amount of time to complete, but each set of exercises will carry only 3% of the total marks. This is designed to encourage you to learn the materials yourself without collaboration and, at the same time, not having to worry too much about the effect these exercises might have on your final grade. It is important that you do not collaborate with other students in doing these exercises. You need to acquire the basic programming skills in order to tackle more interesting and challenging tasks later on. You will be provided with a set of Excel and VBA notes which accompanies 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 each be 3-hour long and they will be held at the end of each block release in the computer lab.

Assessment marks will be allocated as follows:

Tests:	One test at the end of 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 (2 sets of exercises at 3% each)	6%
	Assignment 2	6%
	Course Project (discussed above)	28%
Total:		100%

The due dates for the assignment and the project are listed below:

Assignment 1 (a)	Fri 19 Mar 2010
Assignment 1 (b)	Wed 31 Mar 2010
Assignment 2	Wed 2 Jun 2010
Course project	Mon 28 June 2010

All assignments must be submitted via Blackboard. (http://blackboard.vuw.ac.nz/)

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 (dawn.lorimer@vuw.ac.nz).

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

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; and (ii) achieve a minimum of a 45% average in the two tests.

Class Representative

A class representative will be elected early in the trimester, and that person's name and contact details will be made available to VUWSA, the Course Coordinator and the class. The class representative provides a communication channel to liaise with the Course Coordinator.

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/), email and possibly post. Students are responsible for checking messages in Blackboard on a regular basis and 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.

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 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
http://www.victoria.ac.nz/home/about/policy

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/