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 1, 2013

COURSE OUTLINE

Names and Contact Details

The course coordinator is Joe Cheung. Joe is based in Auckland and therefore the preferred contact is via email in the first instance: jcheung@xtra.co.nz.

The administrator is Rachel Zhang, Room RH307.
Email: viaf-programme@vuw.ac.nz
Phone: 04 4636148

Trimester Dates

Monday 4th March – Sunday 30th June 2013
(Final Assignment Due: Sunday 30th June 2013)

Block Release Times

Block 1 9:00am Friday 26th April – 12:30pm Sunday, 28nd April, 2013
Block 2 9:00am Friday 14th June – 12:30pm Sunday 16th June, 2013

Classes will take place in KK216 on the Kelburn Campus. 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 Course

1. Your fees will be refunded if you withdraw from this course on or before Friday 15 March 2013.

2. The standard last date for withdrawal from this course is Friday 17th May. 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'* including supporting documentation

The application form is available from either of the Faculty's Student Customer Service Desks.

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 based on a number of financial models covering a variety of 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.

Group Work

While no formal group work is required in this paper, informal study groups will be encouraged. However, for all the assignments and course project in this paper, you must hand in your own individual work.

Pre-requisite Skills

Prior knowledge in VBA programming is neither required nor assumed. However, students are expected to have already attained intermediate-level Excel skills before taking this course. It is likely that you have already met this requirement if you are a regular Excel user. However, if you are new to Excel or your Excel skills are at the beginner-level, it is essential that you undertake additional work in Excel before the start of this course.

Note that we will be using Excel 2010. The computer labs at Victoria University only have Excel 2010 installed and therefore you will need to sit the tests in Excel 2010. Even if you are a proficient user of other (especially earlier) Excel versions, it will take you some time to be familiar with Excel 2010. Therefore, it is necessary that you have access to Excel 2010 and use Excel 2010 in completing all the assignments. There are many introductory Excel 2010 books available in bookstores that you might find useful.

While students are not required to have prior programming experience, this course does involve a substantial amount of reading and writing VBA codes. For some students, this could be a highly time-consuming and frustrating experience. Therefore, before committing to take this course, it is strongly recommended that you consider very carefully whether you really want to and are prepared to invest the time and efforts to learn advanced Excel modelling skills.

Expected Workload

	Activity type	Number of hours
Outside the two block releases		
	Readings/studying	100 hours
	Assignments	25 hours
	Project	25 hours
During the two block releases		
	Lectures/tests	40 hours
	Studying	10 hours

Course Learning Objectives

This course is designed to provide a link between theory and practice in Finance. The key objective is to equip students with the skills and knowledge of building financial models using Excel. To achieve this objective, students will learn basic programming and modelling skills in

VBA and in Excel. These skills will be applied to build financial models using materials covered in this and other courses offered in the VIAF programme. On completion of this course, students would have developed the confidence and skills required to build their own financial models to tackle problems in many areas of Finance.

Course Content

A practical course delivered through a combination of lectures and workshops in which students build spreadsheet models to solve a variety of problems from topics in finance. Financial statement modelling leasing; portfolio analysis; computing the efficient frontier; Black-Scholes model; real options; volatility at risk; duration and immunisation; default adjusted expected bond returns.

Readings

- Simon Benninga, Financial Modelling, 3rd edition, the MIT Press.
- Supplementary notes for the first session.
- Introductory books on Excel 2010 (you need to purchase these books yourself if required).

Materials and Equipment

Students need to have access to Excel 2010 in order to study for this course. All assignments, class examples and tests will be based on Excel 2010. The tests will be open-book and you will be asked to answer the test questions in Excel 2010 in the computer lab.

First Block (Friday 26th April – Sunday 28th April): Introduction to VBA with Applications in Financial Modelling

Materials to be covered

The main objective of the first block is to introduce students to basic VBA programming and modelling skills in Excel. These skills will be applied to build a number of financial models.

Excel and VBA skills:

- Advance Excel functions, arrays and interactive charts
- Object oriented programming and VBA programming environment
- Variable types and use of VBA variables and arrays
- Range object and properties
- Basic VBA programming language structures
- Arrays and dynamic arrays
- Writing VBA functions
- Writing array functions

Applications in Finance:

- Financial arithmetic with user-defined functions
- Term structure problems such as deriving a zero-coupon yield curve, curve fitting and simple term structure modelling
- Price and return distributions of financial assets
- Performing simulations in Excel and VBA
- Value at risk and bootstrapping methods

Readings

1. Text: John Simon Benninga, Financial Modelling, 3rd 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 and available on Blackboard).

Second Block (Friday 14th June – Sun 16th June): Building Advanced Models in Finance

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 more advanced Finance topics which include: option valuation, portfolio optimisation, reverse optimisation, duration, immunisation and default-adjusted expected bond returns.

Readings

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

Textbook chapter(s)	***Topic***
16, 19	Option valuation
8, 9, 10.1-10.6, 12	Portfolio selection
13	Black-Litterman approach to portfolio optimisation
25, 26	Duration and immunisation
28	Default-adjusted expected bond returns

Assessment

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

Assessment Item	Weight	Learning Objectives
Test 1 (3 hours)	30%	Acquire essential financial modelling skills in Excel and VBA programming
Test 2 (3 hours)	30%	Apply financial modelling skills to more advanced topics in Finance
Assignment 1a	3%	Acquire essential financial modelling skills in VBA programming
Assignment 1b	3%	Acquire essential financial modelling skills in VBA programming

Assignment 2	6%	Apply financial modelling skills to more advanced topics in Finance
Project	28%	Build a financial model using skills acquired in the course to tackle a practical problem
Total	*100%*	

Dates when assessment items are due or take place:

Assessment Item	**Date/Due Date**
Assignment 1a	(Tue) 2nd April 2013
Assignment 1b	(Tue) 16th April 2013
Test 1 (3 hours)	(Sun) 28th April 2013
Assignment 2	(Tue) 4th June 2013
Test 2 (3 hours)	(Sun) 16th June 2013
Project	(Sun) 30th June 2013

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

Course Project

A key learning outcome of this course is to ensure students are capable of building an Excel model in practice. The course project is therefore an integral part of the assessment process. The 28% weight 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. You must develop your own Excel model. A jointly developed model will not be marked.

A financial model will generally consist of a set of inputs, a processing module and a set of outputs (tables, graphs, etc.). It 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 changing input values can affect the model outputs (values, profits, losses, etc).

It is expected that modelling skills covered in this course will be applied to build the model. You can also develop a financial model to solve a problem or as a project at work. However, in that case, you should not use any commercially sensitive data in the model.

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 (by 4 June), although this is not mandatory.

When you hand in your final project, you should attach a brief summary which highlights key features in your model to ensure that the efforts you put into the project will be given due considerations.

Penalties

Marks for each assignment will be reduced by 5% for every day late. The date of submission to Blackboard (until midnight that day) 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 will be accepted.

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.

Mandatory Course Requirements

To achieve a pass in this paper, a student must:

1. obtain an average mark of at least 50% across all course assessments; **and**
2. **obtain an average of 45% or higher in the two tests;** and
3. attend both block releases.

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).

Note that failure to meet mandatory requirements does not prevent a student completing other pieces of assessment, including any final examination. (See section 2 of the Assessment Handbook).

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

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 email. 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 your up-to-date email and postal addresses, as well as ensuring your details are correct on Student Records.

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.

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