TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

School of Economics and Finance

VICTORIA INTERNATIONAL APPLIED FINANCE PROGRAMME

MMAF525 FINANCIAL MODELLING

Trimester 1, 2015

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 for this course is Rachel Zhang, Room RH307.
Email: viaf-programme@vuw.ac.nz
Phone: 04 4636148

Trimester Dates

The teaching/study and assessment period is Monday 2nd March – Wednesday 1st July 2015.

(Note: Due date for the final assignment for this paper is Thursday 25th June 2015.)

Withdrawal from Course

1. Your fees will be refunded if you withdraw from this course on or before Friday 13th March 2015.

2. The standard last date for withdrawal from this course is Friday 5th June. 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 or online.

Class Times and Room Numbers

Block 1 9:00am Saturday 11th April – 12:30pm Monday, 13th April, 2015
Block 2 9:00am Saturday 6th June – 12:30pm Monday 8th June, 2015

Classes will take place in KK216 on the Kelburn Campus. A detailed schedule of each block release will be provided closer to the April and June sessions.

Attendance at all sessions of both block releases is compulsory.

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. Examples based on 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, you must hand in your own individual work for all the assignments and the course project.

Expected Workload

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

The total expected workload for this course is 200 hours.

Prescription

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 including: risk analysis via simulation and bootstrapping; portfolio analysis; computing the efficient frontier; Black-Scholes model; option pricing via simulations; value at risk; duration and immunization; default adjusted expected bond returns.

**** 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. You would probably meet this requirement if you are a regular Excel user. However, if you are new to Excel or your Excel skills are still at the beginner-level, it is essential that you undertake additional work in Excel before the start of this course.

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 are prepared to invest the time and effort to learn some programming and advanced Excel modelling skills. If you are not prepared to put in the time and effort, it is likely that you would struggle to pass this course.

*****Excel Version***

Note that we will be using Excel 2013 for Windows. The computer labs at Victoria University only have Excel 2013 installed and therefore you will need to sit the tests in Excel 2013. Even if you are a proficient user of other (especially earlier) Excel versions, it might take you some time to be familiar with Excel 2013. Therefore, it is important that you have access to Excel 2013 and use Excel 2013 in completing all the assignments. There are many introductory Excel 2013 books available in bookstores that you might find useful.

While Excel 2011 for Mac does support VBA, there are many compatibility issues that you will encounter when switching between that software and Excel 2013 for Windows. You should use Excel 2013 for Windows to do all your assignments and preparations for this course and avoid using Excel 2011 for Mac.

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 acquire essential programming and modelling skills in VBA and Excel. These skills will be applied to build financial models using materials covered in this and other more advanced 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 a number of areas in Finance.

Course Content

- ***First Block (Saturday 11th April – Monday 13th 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 form the basis for building a number of financial models.

Excel and VBA skills:

- Advanced Excel functions, arrays operations and interactive charts
- Object oriented programming and VBA programming environment
- The use of VBA variables and arrays
- VBA objects and properties
- Basic VBA programming language structures
- Arrays and dynamic arrays
- Writing VBA functions (including array functions)
- Writing VBA subroutines

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

Reading materials

1. Text: John Simon Benninga, Financial Modeling, 4th edition, the MIT Press.

Textbook chapter(s)	*Topic*
31, 32, 33, 34, 35	Data tables, functions, arrays/matrices and other useful Excel features
36, 37, 38, 39	Introduction to VBA: User-defined functions, VBA loop structures, macros and user interaction, arrays and objects
1	Basic financial calculations
22.1, 22.2 22.3	Modelling the term structure
25, 26, 27.1 to 27.6	Random number generation, lognormal distribution and simulating stock prices
28	Value at risk and bootstrapping

2. Supplementary notes on Excel and VBA (these are distributed separately and available on Blackboard).

- ***Second Block (Saturday 6th June – Monday 8th 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 including: option valuation, portfolio optimisation, reverse optimisation, duration, immunisation and default-adjusted expected bond returns.

Reading materials

Text: John Simon Benninga, Financial Modelling, 4th edition, the MIT Press.

Textbook chapter(s)	***Topic***
15, 17, 30.1, 30.2	Option valuation
8, 9, 10, 12	Portfolio selection
13	Black-Litterman approach to portfolio optimisation
20, 21	Duration and immunisation
23	Default-adjusted expected bond returns

Readings

- Simon Benninga, Financial Modeling, 4th edition, the MIT Press.
- Supplementary notes for the first session.
- If required, introductory books on Excel 2013 (you will need to get hold of these books yourself).

Materials and Equipment

Students need to have access to Excel 2013 for Windows in order to study for this course. All assignments, class examples and tests will be based on Excel 2013. The tests will be open-book and you will be asked to answer the test questions in Excel 2013 in the computer lab.

Assessment

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

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 programming and modelling skills in VBA and in Excel
Test 2 (3 hours)	30%	Apply financial modelling skills to more advanced topics in Finance
Assignment 1a	3%	Acquire essential programming and modelling skills in VBA and in Excel
Assignment 1b	3%	Acquire essential programming and modelling skills in VBA and in Excel
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 solve a practical problem
Total	*100%*	

Dates when assessment items take place or are due:

Assessment Item	Date/Due Date
Assignment 1a	(Thu) 19th March 2015
Assignment 1b	(Thu) 2nd April 2015
Test 1 (3 hours)	(Mon) 13th April 2015
Assignment 2	(Thu) 28th May 2015
Test 2 (3 hours)	(Mon) 8th June 2015
Project	(Thu) 25th June 2015

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 submitted by more than one person 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' or sensitivity 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 28th May), 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% of the maximum 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.

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) and copy the email to viaf.programme@vuw.ac.nz.

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

Communication of Additional Information
Additional information including assignment questions, details of the block course schedule, feedback on course assessments, etc. will be provided online via Blackboard.

Students are responsible for logging onto Blackboard regularly to check for any updates or announcements, and for ensuring that the VIAF Senior Administrator (viaf-programme@vuw.ac.nz) has you up-to-date email and postal addresses.

If you would like your assessments to be returned to your own personal email address rather than your default Victoria University email address, please ensure that you enter your personal email address in Blackboard and/or notify the course coordinator (jcheung@xtra.co.nz) directly.

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.

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