

School of Economics and Finance

**MMAF 532 SPECIAL TOPIC: STOCK PRICES AND  
VOLATILITY MODELLING**

Trimester One 2007

**COURSE OUTLINE**

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**Staff** Dr John Randal, RH308, phone 463-5558 (coordinator)  
contact by email preferred at: john.randal@vuw.ac.nz

**Lecture times** Tuesdays, 09:30-11:20, RH G02

**Tutorial/lab time** Thursdays, 12:30-14:30, RLWY102

**Objectives**

This course has been designed to introduce students to some of the special features of financial data and the specialised techniques used to cope with these features. The course is intended to be useful preparation for a job as a quantitative analyst, or for postgraduate study in finance. Throughout the course, general and transferable computer skills will be developed, including the ability to program modern financial techniques.

**Course content**

The course will follow Stephen Taylor's book, *Asset Price Dynamics, Volatility, and Prediction*. This is the first time it has been used for the course, so the schedule may be slightly dynamic. Changes will be notified in class.

Date	Topic	Text
27 Feb	Financial data analysis	Ch 2
6 Mar	Stochastic processes	Ch 3
13 Mar	Stylised facts of financial data	Ch 4
20 Mar	Volatility	Ch 8
27 Mar	ARCH processes	Ch 9
3 Apr	ARCH processes, ctd	
<i>Mid-trimester break, 2 weeks</i>		
24 Apr	Estimation	Ch 10
1 May	A volatility switching model	Ch 11
8 May	Switching model, ctd	
15 May	Continuous time processes	Ch 13
22 May	Continuous time processes, ctd	
29 May	Review	

### Readings

Taylor's book is essential reading for this course. There are two copies on three day loan at the RLWY branch of the VUW library (call number HG4636 T246 A) or you may purchase a copy at the VUW Book Centre for \$87.95. Purchase is recommended.

### Course Materials

The statistical software R has been installed on the SCS computers. If you regularly use a non-VUW PC, R is available free of charge at <http://www.r-project.org/> for Windows, Mac or Linux. Alternatively, bring a blank CD-R or a memory stick to John, and he will give you a copy of the most recent version.

### Assessment

The course content will be assessed by way of four project assignments. These will be distributed throughout the course, and will consist of theoretical problems, and computer exercises. They may require some additional background reading. The assignments will be worth 15% each, i.e. 60% in total.

Topic	Lectures	Due date
Stylised facts and volatility	L3,4	Friday 29 March, 2pm
ARCH processes	L5,6	Friday April 26, 2pm
Volatility switching model	L8,9	Friday 17 May, 2pm
Continuous time processes	L10,11	Friday 31 May, 2pm

The course will also be assessed via a two hour exam in the University exam period (30 May–18 June). This exam will consist of essay questions (possibly including mathematical argument) which will test appreciation and understanding of the techniques covered and their role in financial research. The exam will be worth the remaining 40%.

In the event that this assessment scheme yields a fail grade, but the exam mark alone yields a pass, a C pass will be awarded.

**Penalties**

Projects handed in late will attract a 10% penalty per day for the first five days, and be awarded zero after five days. Extensions may be negotiated prior to the deadline but not after.

**Mandatory course requirements**

All projects must be submitted, and the examination attended. A short computing assignment must be completed to the required standard, and submitted at or before the second tutorial.

**Communication of additional information**

Course notices will generally be relayed in class, via email, and put on Blackboard. Any queries should be directed to John.

**Appendix**

An appendix to this document, containing essential references to important university policies is available on Blackboard.