

School of Economics and Finance  
**FINA 304 FINANCIAL ECONOMETRICS**

Trimester 1, 2013

**COURSE OUTLINE**

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**Staff**

John Randal, RH331, 463 5558, john.randal@vuw.ac.nz (course coordinator)

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Bonnie Riley, RH 321, 463 5380, bonnie.riley@vuw.ac.nz (administrator)

Dr Randal will teach the first half of the course, Dr Roberts the second.

**Class times and rooms:**

Lectures: Monday and Wednesday, 9:30-10:20am, RHLT3

Computer lab (tutorial): Wednesday, 10:30-11:20am, RWW128

**Trimester Dates**

*Teaching Period:* Monday 4 March - Friday 7 June

*Study Period:* Monday 10 June - Thursday 13 June

*Examination Period:* Friday 14 June - Wednesday 3 July (inclusive)

**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 17 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 Learning Objectives**

1. document properties of various types of financial data and analyse them with the appropriate econometric tools
2. apply classical regression models to CAPM
3. apply extensions of classical regression models to finance
4. understand and apply maximum likelihood estimation
5. estimate ARCH and GARCH models
6. estimate regime switching models

## Readings

The text is: Stephen J. Taylor, *Asset Price Dynamics, Volatility, and Prediction*, Princeton University Press, 2005, ISBN 0-691-11537-0.

The VUW library has a web page that contains detailed information about library resources and has links to other sites. Its URL is <http://www.vuw.ac.nz/library>

Additional notes will complement the textbook for many lectures. These notes will be posted to blackboard before relevant lectures.

## Course content

Chapter references are to Taylor. You should prepare for each lecture by skim-reading the indicated textbook sections - do not try to read them in detail until *after* the lecture.

Content and timing of the course may differ slightly from those shown below.

Date	Lecture	Topic	Text	Tut
4 Mar	1	Prices and returns; model vs DGP	Ch 2	
6 Mar	2	Returns and volatility; stylized facts	Ch 4	
11 Mar	3	Stationary time series; autocorrelation	3.1-3.2	
13 Mar	4	white noise; MA(1) process	3.3-3.5	
18 Mar	5	AR(1) process	3.5	
20 Mar	6	ARMA(1,1) process	3.5	T
25 Mar	7	Conditional heteroscedasticity	Ch 8, 9.1	
27 Mar	8	ARCH(1) process	9.2	T
<i>Easter break, Thursday 28 March - Wednesday 3 April</i>				
8 Apr	9	ARCH continued	9.2	
10 Apr	10	GARCH(1,1)	9.3	T
15 Apr	11	GARCH continued	9.3-9.4	
17 Apr	12	GARCH continued	9.5, 10.4, 10.6	
18 Apr		<b>Assignment 1 due, 5pm, box 78, RHMZ</b>		
<i>Mid-trimester break, Monday 22 April - Friday 26 April</i>				
29 Apr	13	Standard stochastic volatility model	11.1-11.3, 11.5	
1 May	14	Markov Chain, two-state HMM	11.4	T
6 May	15	Two-state HMM continued	11.4	
8 May	16	Multistate HMM	11.4	
8 May		<b>Test, 2 hours, lectures 1-12 inclusive, 6:30-8:30pm, venue TBC</b>		
13 May	17	HMM estimation	11.4	
15 May	18	HMM estimation continued	11.4	T
20 May	19	The random walk model	3.7, 5.1-5.3	
22 May	20	Itô's Lemma, GBM and returns	13.3	T
27 May	21	Extensions to GBM	13.4-13.6	
29 May	22	Extensions to GBM continued	13.4-13.6	T
30 May		<b>Assignment 2 due, 5pm, box 78, RHMZ</b>		
3 June	23	<i>NO LECTURE: Queen's birthday</i>		
5 June	24	Revision		T
<i>Examination, 2 hours, see <a href="http://www.victoria.ac.nz/timetables/index.aspx">http://www.victoria.ac.nz/timetables/index.aspx</a></i>				

The following chapters are not covered in this course: 6-7, 12, 14-16. Lecture materials will be supported by practice in the lab tutorials, and through tutorial assignments.

## **Tutorial problems**

There will be a tutorial problems assigned in advance of each tutorial. These do not count towards assessment, but will be an important part of your preparation for the test and exam, and will be directly relevant for the two practical assignments. The tutorial schedule, and tutorial problems, will be distributed via Blackboard.

## **Expected workload**

In weeks when there is a tutorial you should spend 3 hours in class per week (2 lectures and 1 tutorial); in the remaining weeks you should spend 2 hours in class per week (2 lectures). You should expect to spend an additional 6-8 hours per week reading, studying and completing assignments. Overall it is expected that you will spend approximately 150 hours on completing this course.

## **Materials and Equipment**

It will be useful for you to have access to the statistical software R on your personal computer. Bring a memory stick to John and he will provide you with an installation file. Alternatively, if bandwidth is not an issue, download it from <http://www.r-project.org/>.

## **Assessment Requirements**

- There will be two practical assignments. The first will focus on stationary time series models, including GARCH, and will be due on Thursday 18 April (week 6) at 5pm. The second will focus on the HMM model and will be due Thursday 30 May (week 11) at 5pm. *Each assignment is worth 10% of your final grade.* All assignments must be submitted on time to Box 78 on the Mezzanine floor, Rutherford House.
- A two-hour in-term test will be held on Wednesday 8 May, between 6:30pm and 8:30pm, and will cover content from lectures 1 to 12 inclusive. *This test is worth 40% of your final grade.*
- The final exam will be two hours. This will assess material primarily from lectures 13-24 inclusive. *This exam is worth the remaining 40% of your final grade.*

Your assessed work may 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 VBS programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

## **Penalties**

Late assignments will have 10% deducted per day for the first 5 weekdays, and will be given 0 thereafter. Extensions must be negotiated by close of business Friday preceding the due date.

## **Examinations**

Students who enrol in courses with examinations are obliged to attend an examination at the University at any time during the formal examination period. The final examination for this course will be scheduled at some time during the period from Friday 14 June - Wednesday 3 July 2013.

## **Group work**

None

**Mandatory course requirements**

None

**Class representative**

A class representative will be elected in the first week, whose 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 on behalf of students.

**Communication of additional information**

Additional information will be conveyed to students via Blackboard and/or email.

Emails may be sent to the address that you supplied with your enrolment; but they may also be sent to your SCS email address, which is your official university email address. You should keep an eye on both email addresses.

**Link to general information**

For general information about course-related matters, see <http://www.victoria.ac.nz/vbs/studenthelp/general-course-information>