

School of Economics and Finance  
**ECON 406 ECONOMIC DYNAMICS A**  
Trimester 1 2007  
**COURSE OUTLINE**

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**Lecturer:**           • Jacek Krawczyk, RH325, phone 4635352  
                              contact by email preferred at: Jacek.Krawczyk

**Lecture times:**    CRN1221: "R" (Thursday), 12:40-14:30, GBG07

The Course Coordinator is Jacek Krawczyk. He has overall responsibility for the course. You should see him if you are having difficulties that you have been unable to resolve or if you need to make special arrangements because of a disability, or if you want to appeal your assignment mark.

You can find Blackboard at <http://www.blackboard.vuw.ac.nz/> - if ECON 406 does not appear, please email Jacek Krawczyk immediately, with your SCS username.

### **Course Objectives**

To teach economic applications of discrete-time deterministic and stochastic optimal control. Students passing this course should be able to model and solve basic dynamic optimisation problems.

### **Readings**

The text for the first ten lectures is J. B. Krawczyk (2007) "Conflicts over time: an easy application to dynamic games" ECON 406 and 407 Lecture Notes. This is available from Blackboard. Some notes for lectures 9-12 will be also made available on Blackboard.

Complementary books which might provide useful alternative explanations and practice exercises are:

- D. Bertsekas. "Dynamic Programming and Stochastic Control".
- P. Whittle. "Optimal Control: Basics and Beyond". Closed Reserve.
- L. Ljungqvist & T.J. Sargent. "Recursive Macroeconomic Theory"

- D.A. Carlson, A.B. Haurie & A. Leizarowitz. "Infinite Horizon Optimal Control".

The VUW library has a web page that contains detailed information about available library resources and has links to several other sites.

Its URL is <http://www.vuw.ac.nz/library>

### **Materials and Equipment**

You do not need any special equipment for this course. All numerical examples provided at lectures and questions to be answered in assignments can be answered on a sheet of paper and using a pen (through calculus and algebra). However, knowledge of (and access to) Matlab or Maple might be of some help to manipulate some more complex formulae. In examinations, you are allowed to use non-programmable calculators.

### **Assessment Requirements**

Your course mark will be a weighted average of two assignments: 14% & 16% and the final exam: 70%

Final examination is open book; all questions are compulsory.

### **Assignments**

Two assignments will be issued approximately 10 days ahead of their respective deadlines: 23 April and 15 May. The assignments are to be handed in to lecturer or left in his "pigeon" hole by 1200 noon on each of the above dates.

### **Penalties**

Late assignments will be given a grade "0".

### **Mandatory course requirements**

For passing the course obtaining an overall C grade or better is mandatory.

### **Communication of additional information**

Additional information or information on changes will be posted on Blackboard. Some information may be emailed to you via your SCS address, so check this regularly. (This is your University email address.)

### **Course content**

The following is the (tentative) lecture schedule rather than the *timetable*<sup>1</sup> Number (only) references point to Krawczyk (2007) Lecture Notes; W to Whittle; LS to Ljungqvist & Sargent. Please prepare for each lecture by (scanning and) reading the indicated sections.

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<sup>1</sup>Due to the lecturer's overseas leave in May, the lectures will finish in May week 14-18. This means that the last two lectures normally offered between May 21 and June 3 will be rescheduled. The new lecture times will be decided at the first lecture.

Lecture	Topic	Text
1	<i>Description of Dynamic Systems.</i> Discrete or continuous time models? Difference equations. State space models	Intro, IV.1-3
2	<i>Optimal Control.</i> Control models; features. Constraints. Optimisation models. Dynamic programming	V.1-4
3,4	<i>Dynamic Programming (cont.).</i> An analytical solution. Infinite horizon. Optimal allocation between consumption and investment. Time consistency of optimal solutions	V.4-7
5,6	<i>A Simple Steady State vs. a Turnpike Steady State.</i> Steady State Solutions. Turnpike conditions in continuous time. Implicit programming problem. Maximum principle	VI
7,8	<i>Markov decision processes.</i> Markov chains. Computational issues: approximations; value iteration, policy improvement	VII
9,10	<i>Deterministic Linear-Quadratic Models.</i> The centred case. The Riccati equation. The uncentred case.	W 22-28
11	<i>Linear-Quadratic-Gaussian Models.</i>	LS Ch 4
12	<i>Revision and some applications.</i> Certainty equivalence. Separation principle. Kalman filter.	LS Ch 4 & 21

## SUPPLEMENTARY INFORMATION

### Faculty of Commerce and Administration Offices

#### Railway West Wing (RWW) - FCA Student and Academic Services Office

The Faculty's Student and Academic Services Office is located on the ground and first floors of the Railway West Wing. The ground floor counter is the first point of contact for general enquiries and FCA forms. Student Administration Advisers are available to discuss course status and give further advice about FCA qualifications. To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

#### Easterfield (EA) - FCA/Education/Law Kelburn Office

The Kelburn Campus Office for the Faculties of Commerce and Administration, Education and Law is situated in the Easterfield Building - it includes the ground floor reception desk (EA005) and offices 125a to 131 (Level 1). The office is available for the following:

- Duty tutors for student contact and advice.
- Information concerning administrative and academic matters.
- Forms for FCA Student and Academic Services (e.g. application for academic transcripts, requests for degree audit, COP requests).
- Examinations-related information during the examination period.

To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

### General University Policies and Statutes

Students should familiarise themselves with the University's policies and statutes, particularly the Assessment Statute, the Personal Courses of Study Statute, the Statute on Student Conduct and any statutes relating to the particular qualifications being studied; see the Victoria University Calendar or go to <http://www.vuw.ac.nz/policy>.

For information on the following topics, go to the Faculty's website <http://www.vuw.ac.nz/fca>

- Academic Grievances
- Academic Integrity and Plagiarism
- Student and Staff Conduct
- Meeting the Needs of Students with Impairments
- Student Support

### **Manaaki Pihipihinga Programme**

Manaaki Pihipihinga is an academic mentoring programme for undergraduate Māori and Pacific students in the Faculties of Commerce and Administration, and Humanities and Social Sciences. Sessions are held at the Kelburn and Pipitea Campuses in the Mentoring Rooms, 14 Kelburn Parade (back courtyard), Room 109D, and Room 210, Level 2, Railway West Wing. There is also a Pacific Support Coordinator who assists Pacific students by linking them to the services and support they need while studying at Victoria. Another feature of the programme is a support network for Postgraduate students with links to Postgraduate workshops and activities around Campus.

For further information, or to register with the programme, phone (04) 463 5233 ext. 8977 or email [manaaki-pihipihinga-programme@vuw.ac.nz](mailto:manaaki-pihipihinga-programme@vuw.ac.nz). To contact the Pacific Support Coordinator, phone (04) 463 5842 or email [pacific-support-coord@vuw.ac.nz](mailto:pacific-support-coord@vuw.ac.nz).