

School of Economics and Finance
ECON 434 ECONOMIC DYNAMICS
Trimester 1 2010
COURSE OUTLINE

Lecturer: Jacek Krawczyk, RH325, phone 4635352
Contact by email preferred at: J.Krawczyk@vuw.ac.nz

Lecture times: CRN18673: Friday, 14:40-16:30; RWW127

Consultation time: Wednesday, 14:15-15:15, RH325

The course lecturer 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 434 does not appear among your courses, please email Jacek Krawczyk immediately, with your SCS username.

The **final exam** will be held in the period 14 - 30 June 2010.

Withdrawal from Courses:

Information available via
<http://policy.vuw.ac.nz/Amphora!~policy.vuw.ac.nz~POLICY~000000001743.pdf>

Course Objectives

To teach economic applications of discrete-time deterministic and stochastic optimal control. Students passing this course should be able to

- solve linear difference equations;
- understand state-space models;
- build simple optimal-control type economic models;
- solve basic dynamic optimisation problems.

Readings

The text for the first eight lectures is J. B. Krawczyk "Conflicts over time: an easy application to dynamic games" ECON 406 and 407 Lecture Notes ("406" and "407" refer to old SEF honours course numbering). This is available from Blackboard. The remaining lectures will be based on Whittle and Ljungqvist & T.J. Sargent, see below. Some notes for those lectures will be also made available on Blackboard.

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

- D. Luenberger. "Introduction to Dynamic Systems: Theory, Models and Applications".
- 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. The key words for you to try are *optimal control, dynamic optimisation, feedback solutions*.

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 as well as the 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 will be of 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.

Special arrangements for 2010

- The lectures are held on Fridays. This makes them eleven (because of Good Friday), rather than twelve.
- The last four lectures of the course will have to be rescheduled because your lecturer will be on leave from 10 May until the end of June. The four additional lectures will be held in the following weeks: 8-12 March, 22-26 March, 29-31 March and 26-30 April. The times and venue will be announced in the first week of March.

Assignments

Two assignments will be issued approximately 10 days ahead of their respective deadlines: 24 April and 5 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.

Delivery

The course is delivered at RWW127 as a series of two 50 minute sessions held once a week for the duration of the trimester.

Expected Workload

As a guideline, students are expected to spend 8 hours a week on this course including class contact time. This may however vary considerably for individual students.

Penalties

Late assignments will be given a grade "0".

Mandatory course requirements

There are no mandatory requirements for this course.

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*. Number (only) references point to Krawczyk (2008) Lecture Notes; W to Whittle; LS to Ljungqvist & Sargent. Please prepare for each lecture by (scanning and) reading the indicated sections.

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> . Certainty equivalence. Separation principle. Kalman filter.	LS Ch 4 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. To contact the Pacific Support Coordinator, phone (04) 463 5842 or email pacific-support-coord@vuw.ac.nz.