ECN6660  MONETARY ECONOMICS AND DYNAMIC OPTIMISATION

Personnel
Module leader  Dr Kostas Mouratidis
Contact details  Room 414.
consultation and feedback times
Monday 15:00-16:00
Tuesday 15:00-16:00

Prerequisites
For Part A it is assumed that students enrolling onto this have a working knowledge of the following:

- Multivariate calculus and optimisation;
- Linear algebra – including determinants, inversion, eigenvalues and eigenvectors.

For Part B it is assumed that students enrolling onto this have a working knowledge of the following

- Time Series
- Matrix Algebra

Module Aims and Objectives
This is a 15 credit module which comprises two parts. Part A is concerned with Dynamic Optimisation and Recursive Methods in Economics; the lecturer is Kostas Mouratidis. Part B is concerned with Monetary Economics; the lecturer is Kostas Mouratidis.

Part A provides students with the skills to build Rational Expectations dynamic optimisation models based on Dynamic Programming. Part B provide an understanding of research issues concerning monetary macroeconomics, with a focus on how theoretical models can be estimated by econometric models.

The intended learning outcomes are that by the end of the module you should demonstrate an understanding of, and apply in a variety of economic situations,

- The Rational Expectations Model
- The Bellman’s Principle of Optimality
- The impact of inflation on economic growth
- The impact that the credibility of central bank has on inflation and unemployment level
- The uncertainty concerning the effects of monetary policy decision on inflation.
Transferable Skills

- Advanced numerical skills;
- Problem solving and analytical skills;
- Group work;
- Communication and presentation skills.

Timetable

Lectures have the following time/venue (unless otherwise informed): Monday, 13:00 – 15:00, HB LT 21.

Schedule of workshops

Workshop 1 Thursday, 21 February, 13:00 – 13:50, HB Lecture Theatre 21
Workshop 2 Thursday, 06 March, 13:00 – 13:50, HB Lecture Theatre 21
Workshop 3 Thursday, 20 March, 13:00 – 13:50, HB Lecture Theatre 21
Workshop 4 Thursday, 24 April, 13:00 – 13:50, HB Lecture Theatre 21
Workshop 5 Thursday, 01 May 13:00 – 13:50, HB Lecture Theatre 21

Student Responsibilities

This is a 15 credit module and therefore it is expected it will require 150 study hours per student (including formal teaching hours). As a rough guideline this means you should expect to devote about 10 hours of study time per week to this module during a 15 week semester.

Attendance at all lectures and Seminar/Workshops/workshops is compulsory and will be monitored.

Seminar/Workshop exercises will be placed on MOLE at least one week prior to the Seminar/Workshop session and you are expected to work through the exercises prior to the Seminar/Workshop, and to bring your answers to the class. Seminar/Workshops are NOT about giving out answers to the Seminar/Workshop problems, but instead will focus on discussing particular aspects of the material presented that students have found difficult. Students should make use of staff consultation and feedback times to discuss any issues they have with the module and which are not resolved in Seminar/Workshops

Assessment

The assessment of this module will be by unseen exam (100/%),

The exam will be a two-hour exam. It will comprise two sections, one for each part of the module. You will be required to attempt one question from each section. Each section will have two questions to choose from.

A specimen paper is on the module website. The pass mark for this module is 50% overall and there is a minimum mark required for every component of 40%.
Any change to assessment arrangements will be announced in lectures and also via the website.

**Reassessment**
In the case of students who fail the assessment of this module, repeat assessment will be by insert form of resit. Resit candidates must consult the website for further information, up until the time of the reassessment, not merely in semester time.

**Website**
Students must read the module website regularly. The header on the homepage will indicate new posts but students should also check regularly for announcements. Where students are expected to have access to lecture notes in the lecture these will always be posted at least 24 hours before the lecture and Seminar/Workshop assignments at least one week before the relevant session.

**Student Feedback**
The module website has a Module Feedback Report which gives a detailed account by the module leader of the student experience on this module last year.

**Course Outline**
The course starts with Difference Equations and Rational Expectations models. It then presents some basic elements of functional analysis and introduces Dynamic Programming in a deterministic framework. The last part of the course focuses on Dynamic Programming in presence of both additive and multiplicative uncertainty. Throughout, a number of examples will show some applications of recursive methods in economic models.

1. **Difference equations and Rational Expectations models**
   - Difference equations and system of difference equations.
     Long run equilibrium and short run equilibrium. Short run equilibrium as log-linearization around the long run equilibrium.
   - Solving linear rational expectations models.
   - Sunspots and indeterminacy in macroeconomics models.
   - Examples.

2. **Introduction to Dynamic Programming**
   - Metric Spaces, Normed Vector Spaces and operators
   - Contraction Mapping theorem.
   - Blackwell's theorem.
• Continuity, concavity and differentiability of the value function.
• Linear quadratic Dynamic Programming.
• Alternative solutions: by conjecture, by iteration, by envelope theorem.
• Examples.

3. **Dynamic optimisation with uncertainty**

• Stochastic Dynamic Programming.
• Markov chains.
• Certainty and non certainty equivalence.
• Examples.

Relevant papers will be signalled during the lectures and some lecture notes will be also available for download. The course is mainly based on the following sources:


**Part B  Monetary Economics**

The module begins by using econometric techniques to establish a series of stylised facts that describe the behaviour of real-world economies. The module proceeds to review how monetary economists incorporate money into the dynamic general equilibrium models used in modern macroeconomics. Reconciling these theories with the stylised facts is still a fruitful area for research and discussion. The module concludes by considering alternative strategies what the models and empirical analysis imply for the conduct of monetary policy. The final part also analyse the
implication of uncertainty on optimal policy.

1. **Stylised facts of monetary economics**

   VAR Systems,
   
   Structural Form
   
   Impulse response functions
   
   Stylised monetary facts,
   
2. **Micro-foundations of Monetary models**

   Money in utility function,
   
   Cash in advance,
   
3. **Monetary policy**

   Optimal policy,
   
   Simple (Taylor) rules,
   
   Inflation Targeting
   
   Monetary policy under uncertainty and learning

Relevant papers will be signalled during the lectures and some lecture notes will be also available for download. The course is mainly based on the following sources

Note that the schedule of topics may be altered.