## KentVision Code and title of the module

ECON5850 Mathematical Economics

## Division and School/Department or partner institution which will be responsible for management of the module

Division of Human and Social Sciences, School of Economics

## The level of the module (Level 4, Level 5, Level 6 or Level 7)

Level 5

## The number of credits and the ECTS value which the module represents

15 credits (7.5 ECTS)

## Which term(s) the module is to be taught in (or other teaching pattern)

Autumn or Spring

## Prerequisite and co-requisite modules and/or any module restrictions

Prerequisites:

* ECON3040 Principles of Economics
* ECON3050 Mathematics for Economics (60% threshold) or
* ECON3060 Mathematics for Economics (60% threshold)
* ECON3090 Statistics for Economics

## The course(s) of study to which the module contributes

This is an optional module for all Single and Joint Honours Degree courses in Economics.

The module is **NOT** available to students across other degree courses in the University.

## The intended subject specific learning outcomes. On successfully completing the module students will be able to:

8.1 Demonstrate the ability to work with abstract mathematical concepts

8.2 Understand the mathematical aspects of economic modelling techniques

8.3 Formulate and solve problems in economics using a range of mathematical techniques

8.4 Identify the range of more advanced mathematical modelling used in economics

8.5 Use optimization methodologies and matrix algebra

## The intended generic learning outcomes. On successfully completing the module students will be able to:

9.1 Analyse the logic of arguments

9.2 Critically evaluate and solve analytical models

9.3 Communicate and evaluate arguments quantitatively

9.4 Demonstrate critical thinking and higher level quantitative skills

## A synopsis of the curriculum

This module covers a variety of the mathematical methods and their application to economic theory. The module starts off with a review and extension of stage 1 calculus, including integration. We examine production functions, returns to scale and their relation to firm profits. The module then covers dynamic systems where students learn to solve second-order difference equations, and, in so doing, learn about complex numbers. We use this analysis to generate insights about monetary policy. Matrix algebra is explored and used to analyse multiple equation dynamic systems. We then cover more optimisation theory, using Lagrangians to solve problems with equality and inequality constraints. Building on matrix algebra, we use Hessians to examine when we have found a genuinely desired optimum. Some of the further economic ideas we analyse are efficiency wages and monopsony power in the labour market, the duality theory of cost minimisation, and consumer theory, including Roy’s identity and Shephard’s Lemma.

## Reading list

The University is committed to ensuring that core reading materials are in accessible electronic format in line with the Kent Inclusive Practices.

The most up to date reading list for each module can be found on the university's [reading list pages](https://kent.rl.talis.com/index.html).

## Contact Hours

Private Study: 120

Contact Hours: 30

Total: 150

## Assessment methods

* 1. Main assessment methods

Moodle Quiz (10%)

In-Course Test (20%)

Examination, 2 hours (70%)

13.2 Reassessment methods

Reassessment Instrument: 100% exam

## Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section 12) and methods of assessment (section 13)

**Module learning outcomes against learning and teaching methods:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | **8.1** | **8.2** | **8.3** | **8.4** | **8.5** | **9.1** | **9.2** | **9.3** | **9.4** |
| Lecture | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |  |
| Seminar | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Private Study | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

**Module learning outcomes against assessment methods:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | **8.1** | **8.2** | **8.3** | **8.4** | **8.5** | **9.1** | **9.2** | **9.3** | **9.4** |
| Moodle Quiz 1 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Moodle Quiz 2 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Moodle Quiz 3 | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| Examination | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |

## Inclusive module design

The Division recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods.

## Campus(es) or centre(s) where module will be delivered

Canterbury

## Internationalisation

Mathematics is a global language. The module develops skills and techniques that are globally transferrable.

**DIVISIONAL USE ONLY**

**Module record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

| Date approved | New/Major/Minor revision | Start date of delivery of (revised) version | Section revised (if applicable) | Impacts PLOs (Q6 & 7 cover sheet) |
| --- | --- | --- | --- | --- |
| 14/12/2022 | Major | September 2023 | 10, 13, 14 | No |
|  |  |  |  |  |