

# EC139-15 Mathematical Techniques A

**24/25**

**Department**

Economics

**Level**

Undergraduate Level 1

**Module leader**

Emil Kostadinov

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

Multiple

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

The module provides an introduction to mathematical techniques appropriate for joint honour degrees with Economics. You will gain understanding of key concepts in univariate and multivariate calculus, optimization, and linear algebra, and how they are applied within economics. You will also develop appropriate maths-related technical computing skills.

### Module aims

To develop skills in mathematical techniques for a thorough and rigorous study of economic analysis, econometric methods and applied economics, appropriate for joint honours degrees with Economics. The module forms part of the first year core cluster EC120 Quantitative Techniques, which is made up of one module in Mathematical Techniques (A (EC121) or B (EC123)), and one module in Statistical Techniques (A (EC122) or B (EC124)).

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

The module will typically cover the following topics:

Revision of basic algebra; Univariate differential calculus and optimization; Mathematics of growth

and decay; Multivariate differential calculus and optimization; Constrained optimization; Linear algebra; Integral calculus; Applications in economics; mathematical computing skills.

## **Learning outcomes**

By the end of the module, students should be able to:

- acquire understanding of mathematical techniques necessary for a rigorous study of economic analysis and econometric methods, appropriate to joint honours degrees with Economics.
- develop mathematical skills necessary to study core and optional first- and second-year modules in economics for joint honours degrees with Economics.
- develop technical computing skills for writing mathematical text and numerical mathematical analysis

## **Indicative reading list**

Please see Talis Aspire link for most up to date list.

[View reading list on Talis Aspire](#)

## **Subject specific skills**

Students will have the opportunity to develop:

Analytical thinking and communication

Analytical reasoning

Problem-solving

Abstraction

Concepts of Simultaneity and Endogeneity

Analysis of optimisation

## **Transferable skills**

Students will have the opportunity to develop:

Numeracy and quantitative skills

Mathematical, statistical and data-based research skills

IT skills

Written communication skills

Oral communication skills

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## **Study**

## **Study time**

<b>Type</b>	<b>Required</b>
Lectures	10 sessions of 2 hours (13%)
Seminars	8 sessions of 1 hour (5%)
Private study	122 hours (81%)
Total	150 hours

### **Private study description**

Private study will be required in order to prepare for seminars/classes, to review lecture notes, to prepare for forthcoming assessments, tests, and exams, and to undertake wider reading around the subject.

### **Costs**

No further costs have been identified for this module.

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### **Assessment**

You do not need to pass all assessment components to pass the module.

#### **Assessment group D1**

	<b>Weighting</b>	<b>Study time</b>
Test 1 50 minute online test	12%	
Test 2 50 minute online test	12%	
6 x Problem Sets (1% each) Six online problem sets (1% each). One aggregated mark to be given for all six problem sets.	6%	
In-person Examination A paper which examines the course content and ensures learning outcomes are achieved.	70%	

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- Students may use a calculator

#### **Assessment group R1**

	<b>Weighting</b>	<b>Study time</b>
In-person Examination	100%	

## Weighting

## Study time

A paper which examines the course content and ensures learning outcomes are achieved.

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- Students may use a calculator

## Feedback on assessment

The Department of Economics is committed to providing high quality and timely feedback to students on their assessed work, to enable them to review and continuously improve their work. We are dedicated to ensuring feedback is returned to students within 20 University working days of their assessment deadline. Feedback for assignments is returned either on a standardised assessment feedback cover sheet which gives information both by tick boxes and by free comments or via free text comments on tabula, together with the annotated assignment. For tests and problem sets, students receive solutions as an important form of feedback and their marked assignment, with a breakdown of marks and comments by question and sub-question. Students are informed how to access their feedback, either by collecting from the Undergraduate Office or via tabula. Module leaders often provide generic feedback for the cohort outlining what was done well, less well, and what was expected on the assignment and any other common themes. This feedback also includes a cumulative distribution function with summary statistics so students can review their performance in relation to the cohort. This feedback is in addition to the individual-specific feedback on assessment performance.

[Past exam papers for EC139](#)

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## Availability

### Pre-requisites

At least a grade A in GCSE Mathematics, or equivalent.

### Post-requisite modules

If you pass this module, you can take:

- EC226-30 Econometrics 1
- EC208-15 Industrial Economics 1: Market Structure
- EC221-15 Mathematical Economics 1B
- EC242-15 Environmental and Resource Economics
- EC220-15 Mathematical Economics 1A
- EC333-15 Topics in Financial Economics: Theories and International Finance
- EC203-30 Applied Econometrics
- EC236-15 Topics in Applied Economics (2b)
- EC236-15 Topics in Applied Economics (2b)

## Courses

This module is Core optional for:

- Year 1 of UIPA-L1L8 Undergraduate Economic Studies and Global Sustainable Development
- Year 1 of UPHA-L1CA Undergraduate Economics, Psychology and Philosophy
- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)

This module is Core option list A for:

- UECA-LM1D Undergraduate Economics, Politics and International Studies
  - Year 1 of LM1D Economics, Politics and International Studies
  - Year 1 of LM1D Economics, Politics and International Studies
- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 1 of V7ML Philosophy, Politics and Economics (Tripartite)

This module is Core option list B for:

- Year 1 of ULNA-R1L4 Undergraduate French and Economics (4-year)
- Year 1 of ULNA-R3L4 Undergraduate Italian and Economics (4-year)

This module is Core option list C for:

- Year 1 of ULNA-R4L1 Undergraduate Hispanic Studies and Economics (4-year)

This module is Core option list D for:

- Year 1 of ULNA-R2L4 Undergraduate German and Economics (4-year)
- Year 1 of ULNA-R9L1 Undergraduate Modern Languages and Economics (4-year)