EC133-15 Linear Algebra

26/27

Department
Economics
Level
Undergraduate Level 1
Module leader
Nicholas Jackson
Credit value
15
Module duration
10 weeks
Assessment
Multiple
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module allows students to develop a fluency with the algebra of matrices and vectors, and an understanding of topics related to linear transformations, in particular eigenvalues and eigenvectors, coordinate transformations, and matrix diagonalisation and its applications. This provides students with a deeper understanding of techniques used in mathematical economics and econometrics.

Module web page

Module aims

To give the students a clear understanding of some important topics in linear algebra. Students will acquire an understanding of systems of simultaneous linear equations, vectors and linear maps in two-, three- and higher-dimensional space, theory and applications of matrix diagonalisation, general vector spaces, and quadratic forms.

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: Vector and matrix algebra; Vector spaces and coordinate systems; Linear transformations; Eigenvalues and eigenvectors; Simultaneous equations; Matrix diagonalisation; Inner products; Symmetric matrices; Quadratic forms.

Learning outcomes

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

- 1. Reproduce definitions and examples of core concepts, perform standard calculations, and state and prove standard facts and results in linear algebra.
- 2. Interpret, generalize and apply a range of mathematical techniques, concepts and results to questions in linear algebra, and understand their relevance to economics.
- 3. Use existing concepts and theorems to construct illustrative examples and counterexamples and rigorously prove further mathematical results.

Indicative reading list

Reading lists can be found in Talis

Specific reading list for the module

Subject specific skills

Abstraction
Analytical reasoning
Analytical thinking and communication
Critical thinking
Problem solving

Transferable skills

Numeracy and quantitative skills
Mathematical, statistical and data-based research skills
Oral communication
Written communication

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Seminars	8 sessions of 1 hour (5%)
Total	150 hours

Type	Required
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.

Assessment

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

Students can register for this module without taking any assessment.

Assessment group D7

	Weighting	Study time	Eligible for self-certification
Problem Set 1 Take home problem set	10%		No
Problem Set 2 Take home problem set	10%		No
Assessment 3: Quizzes 5 x online quizzes each worth 2% or 0% credit, depending on whether student achieves 80%.	10%		No
Centrally-timetabled examination (On-campus) A paper which examines the course content and ensures learning outcomes are achieved.	70%		No

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- Students may use a calculator
- Answerbook Gold (24 page)

Assessment group R3

	Weighting	Study time	Eligible for self-certification
In-person Examination - Resit	100%		No

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

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 EC133

Availability

Pre-requisites

A-level in Mathematics

Courses

This module is Core optional for:

- Year 1 of UIPA-L1L8 Undergraduate Economic Studies and Global Sustainable Development

This module is Optional for:

- UECA-3 Undergraduate Economics 3 Year Variants
  - Year 1 of L100 Economics
  - Year 1 of L116 Economics and Industrial Organization
- Year 1 of UECA-LM1D Undergraduate Economics, Politics and International Studies
- Year 1 of UPHA-L1CA Undergraduate Economics, Psychology and Philosophy
- Year 1 of UPHA-V7ML Undergraduate Philosophy, Politics and Economics

This module is Unusual option for:

- Year 1 of UPHA-L1CA Undergraduate Economics, Psychology and Philosophy
- Year 1 of UPHA-V7ML Undergraduate Philosophy, Politics and Economics

This module is Option list A for:

- Year 1 of UIPA-L1L8 Undergraduate Economic Studies and Global Sustainable Development
- Year 1 of UPHA-V7ML Undergraduate Philosophy, Politics and Economics