

Mathematical Economics B | ECU33082

Year	Junior Sophister
ECTS Credits	5
Contact Hours	22 hours of lectures and 5 hours of tutorials
Pre-Requisite	ECU22031 & ECU22032 Mathematical and Statistical Methods
Semester	2
Module Leader and Lecturer	Dr Vitaliia Yaremko
Contact Email	vyaremko@tcd.ie

Module Outline:

This module covers topics in linear algebra. The purpose is to extend the treatment of linear algebra given in the Senior Freshman Mathematical and Statistical Methods, and to study applications of linear algebra in economics. The extensions are concerned with more a rigorous exposition of a range of results in matrix algebra and vector space theory.

Topics Covered Include:

- Systems of Linear Equations and Matrices
- Determinants
- Eigenvalues and Eigenvectors
- Vectors and Vector Spaces
- Applications: Social and Economic Networks;
- Applications: Markov Chains;
- Applications: Algebra and Geometry of Ordinary Least Squares.

Module Learning Outcomes:



On successful completion of this module, you will be able to:

- Prove simple linear algebra theorems;
- Formulate economic problems using linear algebra;
- Apply linear algebra solution concepts to economic problems;
- Draw economic insights from solutions to mathematically formulated economic models;

Satisfactory completion of this module will contribute to the development of the following key skills:

- Ability to understand mathematical representations of economic models;
- Ability to represent economic dynamics in mathematical form;
- Ability to use different mathematical techniques to solve economic problems;
- Ability to choose the best (most efficient) mathematical technique for a given economic problem.

Assessment:

- The assessments consist of homework (comprising 30% of the final grade), a test (30% of the grade), and a term project (40% of the grade)

Recommended Reading List:

- *Linear Algebra and Its Applications*, Lay, D. C., Lay, S. R., and McDonald, J. J., 6th (Global) edition, Boston: Pearson, 2021.

It is fine to use one of the recent editions of this textbook.