UNIVERSITY OF LONDON

Course information 2025-26

MT2175 Further Linear Algebra

General information

MODULE LEVEL: 5

CREDIT: 15

NOTIONAL STUDY TIME: 150 hours

MODE: Locally Taught, Independent Learner Route and Online Taught

Summary

In MT1173 Algebra, students have met many of the key concepts of linear algebra. In this course, we study further theoretical material and look at additional applications of linear algebra.

Conditions

Please refer to the relevant programme structure in the EMFSS Programme Regulations to check:

- where this course can be placed on your degree structure; and
- details of prerequisites and corequisites for this course.

You should also refer to the Exclusions list in the EMFSS Programme Regulations to check if any exclusions apply for this course.

Aims and objectives

This half course is designed to:

- enable students to acquire further skills in the techniques of linear algebra, as well as understanding of the principles underlying the subject
- prepare students for further courses in mathematics and/or related disciplines (e.g. economics, actuarial science).

Learning outcomes

At the end of the course and having completed the essential reading and activities students should be able to:

- Knowledge of the concepts, terminology, techniques and conventions covered in the half course.
- The ability to demonstrate an understanding of the underlying principles of the subject.
- The ability to demonstrate the ability to solve unseen mathematical problems involving an understanding of the concepts.

Employability skills

Below are the three most relevant employability skills that students acquire by undertaking this course which can be conveyed to future prospective employers:

1. Complex problem solving
2. Decision making
3. Adaptability and resilience

Essential reading

For full details, please refer to the reading list

Linear Algebra: Concepts and Methods" by M. Anthony and M. Harvey (Cambridge University Press, 2012) [ISBN 978-0521279482]

Assessment

This course is assessed by a two-hour and fifteen-minute closed-book written examination.

Syllabus

This course continues the study of linear algebra initiated in MT1173 Algebra.

Topics covered are:
Diagonalization and Jordan normal form, applied to systems of differential equations.

Inner products, orthogonality, quadratic forms, and orthogonal diagonalization.

Direct sums and projections, with applications to least squares.

Generalized inverses.

Complex numbers. Complex matrices and vector spaces. Hermitian and unitary matrices, unitary diagonalization and spectral decomposition.