UNIVERSITY OF LONDON

Course information 2026-27

MT105a Mathematics 1

General information

MODULE LEVEL: 4

CREDIT: 15

NOTIONAL STUDY TIME: 150 hours

MODE: Locally Taught, Independent Learner Route and Online Taught

Summary

This half course develops basic mathematical methods and will emphasise their applications to problems in economics, management and related areas.

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

The objectives specifically include:

- To enable students to acquire skills in the methods of calculus (including multivariate calculus) and linear algebra, as required for their use in economics-based subjects.
- To prepare students for further units in mathematics and/or related disciplines.

Learning outcomes

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

- used the concepts, terminology, methods and conventions covered in the half course to solve mathematical problems in this subject.
- the ability to solve unseen mathematical problems involving understanding of these concepts and application of these methods
- seen how mathematical techniques can be used to solve problems in economics and related subjects

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.

Anthony, M. and N. Biggs Mathematics for Economics and Finance. (Cambridge: Cambridge University Press, 2024) [ISBN 978-1108459433].

Assessment

This course is assessed by a two-hour and fifteen-minute closed-book written examination (80%) and a sixty-minute Multiple Choice Question assessment (20%).

The MCQ assessment will examine students' knowledge on

- chapters 2, 3 and 4 of the Subject Guide (Locally Taught and Independent Learner students) corresponding to
- units 1, 2 and all topics from unit 3 up to and including "Combined methods" on the digital campus (Online Taught students).

Syllabus

This half course develops basic mathematical methods and will emphasise their applications to problems in economics, management and related areas.

Basics: Basic algebra; Sets, functions and graphs; Factorisation (including cubics); Inverse and composite functions; Exponential and logarithm functions; Trigonometrical functions.

Differentiation: The meaning of the derivative; Standard derivatives; Product rule, quotient rule and chain rule; Optimisation; Curve sketching; Economic applications of the derivative: marginals and profit maximisation.

Integration: Indefinite integrals; Definite integrals; Standard integrals; Substitution method; Integration by parts; Partial fractions; Economic applications of integration: determination of total cost from marginal cost, and cumulative changes.

Functions of several variables: Partial differentiation; Implicit partial differentiation; Critical points and their natures; Optimisation; Economic applications of optimisation; Constrained optimisation and the Lagrange multiplier method; The meaning of the Lagrange multiplier; Economic applications of constrained optimisation.

Matrices and linear equations: Vectors and matrices, and their algebra; Systems of linear equations and their expression in matrix form; Solving systems of linear equations using row operations (in the case where there is a unique solution); Some economic/managerial applications of linear equations.

Sequences and series: Arithmetic and Geometric Progressions; Some Financial application of sequences and series.