

Module Code	ECS1004
Module Title	Quantitative Techniques 1
Level	4
Credit	30
Owning Subject	Economics
Level Restrictions	

Aims

This module aims to introduce the basic mathematical concepts used in economic analysis. These include the basic properties of functions, univariate and multivariate calculus and matrix operations. The course serves as a basis for second year economics courses.

Learning Outcomes

Knowledge

On completion of this module the successful student will be able to:

1. use basic mathematical concepts to solve simple economic problems;
2. write economics problems into mathematical equations and solve systems of equations using linear algebra;
3. model economic functions and perform comparative statics analysis.

Skills

This module will call for the successful student to demonstrate:

4. ability to analyse core macroeconomic and microeconomic models using matrix methods in mathematical economics;
5. ability to analyse core macroeconomic and microeconomic models using calculus methods in mathematical economics.

Syllabus

- Mathematical framework for economics
- Functions
- Logarithm and exponential functions
- Systems of equations and matrix algebra
- Introduction to differential calculus: univariate calculus
- Multivariate calculus: partial derivatives, chain rule, Euler's theorem
- Total differentials and implicit functions
- Identifying and characterizing extreme values of univariate and multivariate functions
- Microeconomic applications: monopoly pricing, duopoly and strategic behaviour, monopolist and segmented markets
- Macroeconomic applications: rules versus discretion, inflation tax, the golden rule.

Learning, Teaching and Assessment Strategy

The content of the module will be delivered via weekly two-hour lecture and one hour seminar sessions. Students can also meet with the lecturer in office feedback hours or by appointment to discuss matters related to the module and their learning progression. Summative short quizzes of 15 minutes duration will be conducted at regular intervals throughout the year during lecture or seminar sessions. This will form part of the learning and teaching as students will get into the habit of revising their learning materials at bitesize whilst clearing up any doubts about the materials that has been covered with the immediate feedback given to them straight after the quizzes.

Assessment Scheme

Formative Assessment

The formative assessment consists of regular homeworks for which feedback will be given. Attendance is compulsory both in lectures and seminars.

Summative Assessment

1. Weeks 2-11: Quizzes once every two weeks, each worth 4%, to assess learning outcomes 1, 2 & 4.
2. Week 12: First in-class test, worth 30%, to assess learning outcomes 1, 2 & 4.
3. Weeks 14-23: Quizzes once every two weeks, each worth 4%, to assess learning outcomes 3, 4 & 5.
4. Week 24: Second in-class test, worth 30%, to assess learning outcomes 2, 3, 4 & 5.

At least 40% or better for EACH ASSESSED COMPONENT is required to pass this module.

Assessment Weighting

Quizzes: 40%; In-class tests: 60%

Learning Materials

Your online reading lists can be accessed from the My Study area of UniHub. They highlight essential and recommended reading for all modules you are registered on.