

EC220-12 Mathematical Economics 1A

20/21

Department

Economics

Level

Undergraduate Level 2

Module leader

Costas Cavounidis

Credit value

12

Module duration

10 weeks

Assessment

100% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Mathematical Economics 1A, "Game Theory," is an introduction to the rigorous mathematical study of strategic interactions. Students will learn how game theorists model such interactions, and how those models can be analyzed. By the end of the module, they will have developed a formidable toolbox of game-theoretic techniques, and will be familiar with a variety of applications of these techniques to real-world situations, both economic and otherwise.

[Module web page](#)

Module aims

Mathematical Economics 1a, "Introduction to Game Theory", aims to provide a basic understanding of pure game theory and also introduce the student to a number of applications of game theory to economic problems of resource allocation.

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: Games in strategic form: Nash equilibrium and

its applications to voting games, oligopoly, provision of public goods. Games in extensive form: sub game perfect equilibrium and its applications to voting games, repeated games. Static games with incomplete information: Bayesian equilibrium and its applications to auctions, contracts and mechanism design. Dynamic games of incomplete information: Perfect Bayesian equilibrium, Sequential equilibrium and its application to signalling games. Bargaining theory: Nash bargaining, non-cooperative bargaining with alternating offers and applications to economic markets. Evolutionary Game Theory Evolutionary game theory.

Learning outcomes

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

- **Subject Specific and Professional Skills:** Demonstrate understanding of the tools of game theory, and the ability to apply them to wide classes of problems. The teaching and learning methods that enable students to achieve this learning outcome are: Lectures, seminars, guided reading and independent study The summative assessment methods that measure the achievement of this learning outcome are: Tests and examination

Indicative reading list

Please see Talis Aspire link for most up to date list.

[View reading list on Talis Aspire](#)

Subject specific skills

Students will have the opportunity to develop skills in:

Analytical thinking and communication

Analytical reasoning

Critical thinking

Strategic thinking

Problem-solving

Abstraction

Policy evaluation

Analysis of incentives

Concepts of Simultaneity and Endogeneity

Analysis of optimisation

Understanding of Uncertainty and Incomplete Information

Transferable skills

Students will have the opportunity to develop:

Numeracy and quantitative skills

Written communication skills

Oral communication skills

Mathematical, statistical and data-based research skills

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (17%)
Seminars	5 sessions of 1 hour (4%)
Private study	95 hours (79%)
Total	120 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 must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group B5

	Weighting	Study time
Online Examination	100%	

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

- Students may use a calculator

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 EC220](#)

Availability

Pre-requisites

EC120 or EC107 for GL11 students

EC120 = EITHER (EC121+EC122+EC125) OR (EC123+EC124+EC125)

To take this module, you must have passed:

- Any of
 - [EC107-30 Economics 1](#)
 - All of
 - [EC121-12 Mathematical Techniques A](#)
 - [EC122-12 Statistical Techniques A](#)
 - [EC125-6 Computing and Data Analysis](#)
 - All of
 - [EC123-12 Mathematical Techniques B](#)
 - [EC124-12 Statistical Techniques B](#)
 - [EC125-6 Computing and Data Analysis](#)

Post-requisite modules

If you pass this module, you can take:

- EC301-15 Mathematical Economics 2: Dynamics, Uncertainty & Asymmetrical Information

Courses

This module is Core for:

- Year 2 of USTA-G300 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics

- USTA-Y602 Undergraduate Mathematics, Operational Research, Statistics and Economics
 - Year 2 of Y602 Mathematics, Operational Research, Stats, Economics
 - Year 2 of Y602 Mathematics, Operational Research, Stats, Economics

This module is Optional for:

- Year 2 of USTA-G1G3 Undergraduate Mathematics and Statistics (BSc MMathStat)
- USTA-GG14 Undergraduate Mathematics and Statistics (BSc)
 - Year 2 of GG14 Mathematics and Statistics
 - Year 2 of GG14 Mathematics and Statistics

This module is Option list B for:

- UMAA-G100 Undergraduate Mathematics (BSc)
 - Year 2 of G100 Mathematics
 - Year 2 of G100 Mathematics
 - Year 2 of G100 Mathematics
- UMAA-G103 Undergraduate Mathematics (MMath)
 - Year 2 of G100 Mathematics
 - Year 2 of G103 Mathematics (MMath)
 - Year 2 of G103 Mathematics (MMath)