

UNIVERSITY OF CAMBRIDGE

ECONOMICS TRIPOS PART IIB Paper 4 – Economic Theory and Analysis Game Theory

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Lectures: Tuesday & Friday 11am–12am
Office Hours: Tues 2-3pm

Description

Optimal decisions of economic agents depend on expectations of other agents' actions. Game theory is a set of analytical tools designed to help us understand behaviour in multi-person decision settings. This eight-hour course examines various models of equilibrium behaviour in various kinds of games: static and dynamic games, games of complete and of incomplete information. Besides introducing the theoretical concepts, we should analyse a wide range of applications.

Textbooks

The main texts are:

R. Gibbons, “*A primer in Game Theory*”, Pearson. (henceforth **G**)

M. Osborne, “*An introduction to Game Theory*”, Oxford. (**O**)

Mas-Colell, A., A. Whinston and J. Green (1995): “*Microeconomic Theory*”, Oxford. (**MWG**)

General microeconomics textbooks that include some sections on Game Theory:

Jehle, G and P. Reny, “*Advanced Microeconomic Theory*”, Addison Wesley.

More advanced (graduate) textbooks include:

Fudenberg, D. and J. Tirole (1991), “*Game Theory*”, MIT.

Osborne, M. and A. Rubinstein, “*A course in Game Theory*”, MIT.

Course Outline

There are five lectures, although the last one will only be covered if there is enough time. Each lecture should last two hours (i.e. one week), roughly. A brief guide follows, with contents and suggested readings from the textbooks mentioned above. Some of the applications may not be covered since they are already covered elsewhere in this paper.

1. **Introduction and elements.**

Examples of games. Extensive and strategic form representations. The concept of strategy. Mixed strategies.

G: Chapters 1.1.A, 1.3.A and 2.4.A. O: Chapters 1, 4.1-4.3.1 and 5.1-5.2. MWG: Chapter 7.

2. **Static games with complete information.**

Dominant and dominated strategies. Nash equilibrium. Applications: static oligopoly, political economy.

G: Chapter 1. O: Chapters 2-4. MWG: Chapters 8.A-8.D.

3. **Dynamic games with complete information.**

i. Subgame perfect equilibrium. Applications: bargaining, dynamic oligopoly.

ii. Repeated games. Folk Theorem. Application: collusion.

G: Chapter 2. O: Chapters 5-7. MWG: Chapter 9.B.

4. **Static games with incomplete information.**

Bayesian Nash Equilibrium. Applications: static oligopoly, public goods, auctions.

G: Chapter 3. O: Chapter 9. MWG: Chapter 8.E.

5. **Dynamic games with incomplete information** (time permitting).

(Weak) Perfect Bayesian equilibrium. Sequential equilibrium. Application: signalling, cheap talk.

G: Chapter 4. O: Chapter 10. MWG: Chapter 9.C.