Part IIB Paper 4: Economic Theory & Analysis
Paper Coordinator: Prof. Robert Evans (rae1@cam.ac.uk)

The paper deals with theoretical economic models and their analysis, going beyond the material taught in Part IIA, Paper 1. An aptitude and taste for logical thinking are essential and fluency in elementary mathematics (algebraic equations, graphs, basic calculus) is required.

There are three lecture courses:

Game Theory and Contract Theory with Applications (Prof. Robert Evans, 20 hours, Michaelmas)
Market Design (Dr Aytek Erdil, 8 hours, Lent)
Networks (Prof. Sanjeev Goyal, 4 hours, Lent)

Game Theory and Contract Theory with Applications:
The first part of this course will build on the Game Theory course in Part IIA Paper 1. It will first review the theory of games of complete information taught in Part IIA, but in a somewhat deeper and more formal way, and then cover static and dynamic games of incomplete information in the context of an array of economic examples including, in particular, auctions and bargaining. In the second part of the course we will discuss the theory of optimal contracting in static models with adverse selection, both with one agent (the screening model) and with many (in particular, optimal auctions).

Reading
- Ken Binmore, 'Playing for Real: A Text on Game Theory', OUP 2007. Martin Osborne, 'An Introduction to Game Theory', OUP 2003.
- David Kreps, 'A Course on Microeconomic Theory', Princeton University Press. Vijay Krishna, 'Auction theory', Academic Press.
- Jean-Jacques Laffont and David Martimort, 'The Theory of Incentives: The Principal-Agent Model', Princeton University Press.

Market Design:
While prices play a central role in the allocation of resources and jobs in many markets, there are economic environments where prices cannot serve a role in aggregating preferences and determining the final allocations. Matching is the study of who is matched with whom (or what) in the absence of a price mechanism to determine the economic outcomes. Examples include school admissions, allocation of organs for transplantation, entry level job markets for junior doctors and teachers. We will explore the design and use of centralised clearing houses and/or mechanisms to help achieve allocations which satisfy a combination of desirable economic/political/ethical properties such as efficiency, equity, and/or fairness.

Reading

- Atila Abdulkadiroglu and Tayfun Sonmez, 'Matching Markets: Theory and Practice', in Advances in Economics and Econometrics: Tenth World Congress, 2013, Cambridge University Press (Edited by Daron Acemoglu, Manuel Arellano, Eddie Dekel)
- Muriel Niederle, Alvin E. Roth and Tayfun Sonmez, 'Matching and Market Design', in New Palgrave Dictionary of Economics, Second Edition, 2008 (Edited by Steven N. Durlauf and Lawrence E. Blume)
- Alvin Roth (2008). 'Deferred acceptance algorithms: history, theory, practice, and open questions.' *Int J Game Theory*, 36:537--569.

- Tayfun Sonmez and Utku Unver (2011). 'Matching, Allocation, and Exchange of Discrete Resources.' *Handbook of Social Economics* Vol.1A. 781--852.

Networks:

Networks range from physical infrastructure – like roads and canals -- to tangible economic ties – such as financial linkages and supply chains -- and encompass the subtle and delicate ties that connect us to our friends and family. These lectures will introduce students to the principles that govern the formation and the functioning of networks.

Readings:

S. Goyal (2007), Connections: an introduction to the economics of networks. PUP.

G. Charness, F. Ferri, M. A. Melendez-Jimenez and M. Sutter (2014), Experimental Games on Networks: Underpinnings of behavior and Equilibrium Selection, Econometrica, 82, 5, 1615-1670.

S. Choi, S. Goyal, F. Moisan (2020), Large Scale Experiments on Networks: A New Platform and Applications. Working Paper, Cambridge University.

Examination

For details of the examination structure, please refer to the Form and Conduct Notice pages on Moodle.