Economics 291
Spring 2008

Social and Economic Networks

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The text for the course is:
Matthew O. Jackson (2008) *Social and Economic Networks*, Princeton University Press.

Social networks pervade our social and economic lives. They play a central role in the transmission of information about job opportunities and are critical to the trade of many goods and services. They are important in determining how diseases spread, which products we buy, which languages we speak, how we vote, as well as whether or not we decide to become criminals, how much education we obtain, and our likelihood of succeeding professionally. The countless ways in which network structures affect our well-being make it critical to understand how social network structures impact behavior, which network structures are likely to emerge in a society, and why we organize ourselves as we do. This course provides an overview and synthesis of research on social and economic networks, drawing on studies by sociologists, economists, computer scientists, physicists, and mathematicians.

The course starts with an overview of social and economic networks, and the embeddedness of economic activity. It then will examine how to describe and measure networks as well as empirical observations about network structure. Next, we will examine models of how networks form, including random network models and strategic formation models. We will take a long look at how networks impact behavior, including infection, diffusion, learning, peer influences, games played on network, and networked markets. The course will conclude with an examination of some areas for further research.

The course will involve biweekly problem sets and a final project. You may consult with your classmates on the problem sets, but not until you have worked through each problem on your own. Late problem sets will not be accepted without prior permission and good reason. The final project involves either the analysis of a social or ecconomic network, or a theoretical contribution. The project will be due at the end of finals week and should be no longer than 20 pages (double spaced with 1 inch margins and 12 point type including all appendices, figures, and references). You may work in groups on the final project, but with no more than three people on a project. Grades will be based on an equal weighting of the problem sets and final project.

Syllabus

Background on Network Analysis

- Introduction and Overview (1 lecture - April 2)

  Examples of Social Networks and their Impact, Why Model Networks?

  Chapter 1

- Describing and Measuring Networks and Empirical Background (2 lectures - April 2 and 7)

  Definitions: Centrality, Clustering, Degrees, Diameters, Small Worlds, Weak and Strong Ties, Opinion Leaders...

  Chapters 2 and 3

Network Formation

- Random Networks (2 lectures - April 9 and 14)

  Poisson Random Networks, P* Networks and Correlation in Degrees, Thresholds and Phase Transitions

  Chapter 4.

- Growing Random Networks (1.5 lectures - April 16 and 21)

  Preferential Attachment and Power Laws, Hybrid models of Network Formation, Fitting Networks to Data

  Chapter 5.

- Strategic Network Formation (2.5 lectures - April 21, 23 and 28)

  Game Theoretic Modeling of Network Formation, Dynamics, Conflict between Incentives and Efficiency, Myopic versus Forward Looking Network Formation

  Chapters 6 and 11.

Behavior and Networks

- Diffusion on Networks. (2 lectures - April 30 and May 5)

  Components, Cohesiveness and Contagion, Infection

  Chapter 7.

- Learning on Networks. (2 lectures - May 7, 12)

  Bayesian Learning on Networks, Boundedly Rational Learning,

  Chapter 8.

- Games Played on Networks. (3 lectures - May 14, 19, 21)

  Markov Models of Behavior, Graphical Games, Network Games, Complements and Substitutes

  Chapter 9.

- Networks and Markets. (2 lectures - May 28 and June 2)

  Empirical Studies of Trade, Bargaining and Trading on Networks, Experiments on Network Transactions, Price Dispersion, Labor Markets

  Chapter 10.

Methods

- Foundational Holes, (1 lecture - June 4)

  Allocations on Networks, Mixing Random and Strategic Formation, Community Structures

  Excerpts from Chapters 11 and 13.