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## Social Networks

Fall 2013

Location: Robertson 438

Hours: Wednesdays 2:30-4:30pm

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Organizers:

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### Description

Social networks can determine the information that economic and political agents acquire, how they use it, and whether and how their actions affect others connected to them. Segregation, corruption, revolutions, changes in public opinion, voting, trade, migration, bargaining in legislatures are some examples of social phenomena in which networked structures play a major role. The goal of this reading group is to provide its participants with the minimum tools for modeling networks. Two questions would be the focus of study: What kinds of network structures emerge in society, and how do these structures affect behavior?

### Requirements

In each of our meetings, two members of the reading group would be in charge to give a lecture on a given topic and to answer questions about the readings that other members might have. The only restriction on these presentations is that they should cover the material from the textbook that was scheduled for that day. If time allows it, the presenters could prepare an exercise, or perhaps, discuss a paper related to the topic of the day. The responsibilities of the audience are to keep up with the readings and to bring any questions about the material assigned for that week.

### Prerequisites

Basic knowledge of probability theory (distributions, expected values, Bayes' rule), linear algebra (matrix operations), and calculus are required. For topics that require other mathematical concepts, the presenters would be in charge to introduce them.

### Readings

The textbook that will serve as guide for our sessions is

- Jackson Matthew O. *Social and Economic Networks*. Princeton University Press.

A book that covers similar topics at a lower level of mathematical complexity is

- Easley David and Jon Kleinberg. *Networks, Crowds, and Markets: Reasoning about a Highly Connected World*. Cambridge University Press.

## Outline

The outline gives the topic of each session and suggest a division of the sections in the book that will be covered. The presenters however, are free to divide among themselves the material as they see fit.

- September 25. Intro, representation and measurement (John B. Londregan and Miguel R. Rueda)
  - 1
  - 2.1-2.1.5
- October 2. Measurement and empirical background
  - 2.1.6-2.3 (Miguel R. Rueda)
  - 3
- October 9. Static random-graph models
  - 4.1
  - 4.2-4.2.3
- October 16. Properties of random networks
  - 4.2.4-4.3
  - 5.1-5.3.1
- October 23. Growing random networks and strategic formation
  - 5.3.2-5.4.5
  - 6.1-6.2

*Fall recess*

- November 6. Strategic formation II
  - 6.3-6.3.3
  - 6.4-6.5
- November 13. Strategic formation III
  - 6.6
  - 7.1-7.2.4
- November 20. Diffusion
  - 7.2.5-7.2.6
  - 7.3

*Thanksgiving break*

- December 4. Learning
  - 8.1-8.3.2
  - 8.3.3-8.3.5
- December 11. Imitation and games on networks
  - 8.3.6-8.3.7
  - 9.1-9.1.3