

Advanced Microeconomic Analysis II: Communication and Networks

Columbia University, Spring 2010

Description: This is a Ph.D. elective course in Microeconomic Theory. This year we will study two topics that are the subject of much current research: (1) strategic transmission of private information; (2) social and economic networks. The goal is to introduce you to the basic tools and models in these fields and to facilitate your transition from coursework to your own research.

Pre-requisites: Knowledge of non-cooperative game theory at the level of a first year Ph.D. course is sufficient. You should be comfortable with solving games of incomplete information and refinements of Nash equilibrium such as sequential equilibrium. Some background in general microeconomics is also helpful (the first year Ph.D. micro sequence is more than enough).

Logistics:

Instructor: Navin Kartik, IAB 1029, nkartik@columbia.edu.

Meetings: Mon 9.00-10.50am in IAB 501A. There will be no meeting on March 15 (Spring Recess). Some classes may be rescheduled due to guest lectures.

Office Hours: Mon 4.15-6:00pm; feel free to make an appointment for other times.

Course website: <https://courseworks.columbia.edu>.

Requirements and Grading: Aside from regular attendance and active participation in class discussion, there are three things I ask of you:

1. I will assign occasional homework exercises, 2–4 over the course of the semester. These are intended to bolster our understanding of the material we have covered. Although you should each turn in separate solutions, you are encouraged to collaborate on solving the problems.
2. In small groups, you will make a presentation in class based on a paper of your choice in the second part of the course on social networks. I recommend you pick a paper from the list provided below; however, you could also suggest something else. In any case, you should confirm your choice with me. The length of the presentations will be decided based on enrollment.
3. At the end of the semester, you should produce a research paper. While I hope that the material we cover in class is stimulating enough that you will write about a related issue, you can choose any theoretical topic so long as you use non-cooperative game theory to address it. An acceptable paper would include a clearly formulated

question, some motivation (either theoretical or applied), an explanation of what the related literature is and how it does not address your particular question, at least a sketch of a model, and some conjectures of formal results with some intuition for why they might true. For all this to be feasible by the end of the semester, you should talk to me no later than spring recess (preferably sooner) about potential projects. If you want to submit a paper that has been or will also be submitted for a different course, please check with me in advance.

Your course grade will reflect my view of your overall performance, primarily based on your presentation and research paper, and secondarily on reasonable attempts at homework and class participation. Beyond these guidelines, I have not formulated a precise grading scheme, given that this is an elective course focussed on getting you into research mode rather than worrying about grades. If this is a source of concern, tell me, and we will work something out.

Readings: For the first part of the course, we will rely entirely on papers that are available online. For the second part of the course (on networks), we will not only read papers, but also use the following recent textbook:

- Matthew O. Jackson, *Social and Economic Networks*, Princeton University Press, 2008.

I may also draw upon a related textbook:

- Sanjeev Goyal, *Connections: An Introduction to the Economics of Networks*, Princeton University Press, 2007.

Finally, here is a nice undergraduate-level introduction to networks:

- David Easley and Jon Kleinberg, *Networks, Crowds, and Markets: Reasoning about a Highly Connected World*, Cambridge University Press, forthcoming in 2010. Available online at <http://www.cs.cornell.edu/home/kleinber/networks-book/>

Tentative Schedule

We will have a few guest lectures from experts during the semester, indicated in the schedule below. For each class, I have divided readings into “required” and “optional”. Please complete the former prior to class as they will form the basis for lectures.

I. Strategic Communication

1. Jan. 25: *Introduction & Canonical Model*
 - Required: [Crawford and Sobel \(1982\)](#)
 - Optional: [Farrell and Rabin \(1996\)](#)
2. Feb. 1: *Canonical Model continued*
 - Required: [Chen, Kartik, and Sobel \(2008\)](#)
 - Optional: [Green and Stokey \(2007\)](#), [Farrell \(1993\)](#), [Kartik, Ottaviani, and Squintani \(2007\)](#)
3. Feb. 8: *Multi-dimensional Cheap Talk*
 - Required: [Chakraborty and Harbaugh \(2007\)](#), [Ambrus and Takahashi \(2008\)](#)
 - Optional: [Battaglini \(2002\)](#), [Levy and Razin \(2007\)](#), [Ambrus and Lu \(2009\)](#)
4. Feb. 15: *Repeated Cheap Talk*
 - Required: [Morris \(2001\)](#), [Sobel \(1985\)](#)
5. Feb. 22: *Verifiable Information*
 - Required: [Milgrom \(1981, Section 5\)](#), [Seidmann and Winter \(1997\)](#)
 - Optional: [Forges and Koessler \(2005\)](#), [Shin \(1994\)](#), [Kartik \(2009\)](#), [Dziuda \(2008\)](#)
6. Mar. 1: *Arms Races - guest lecture by Tomas Sjöström*
 - Required: [Baliga and Sjöström \(2004\)](#), [Baliga and Sjöström \(2008\)](#)
 - Optional: [Baliga and Sjöström \(2009\)](#)

II. Social and Economic Networks

The coverage here is particularly subject to change, so check for an update a few weeks into the semester.

7. Mar. 8: *Likely two guest lectures by Andrea Galeotti this week*
8. Mar. 22: *Network Properties and Random Networks*
 - Required: Chapters 2–4 of Jackson book

- Optional: Chapter 2 of Goyal book
9. Mar. 29: *Strategic Network Formation*
- Required: Chapters 6 and 11 of Jackson book
 - Optional: Chapter 7 of Goyal book, [Bala and Goyal \(2000\)](#), [Jackson and Wolinsky \(1996\)](#)
10. Apr. 5: Bayesian Observational Learning on Networks
- Required: [Bikhchandani, Hirshleifer, and Welch \(1992\)](#), [Acemoglu, Dahleh, Lobel, and Ozdaglar \(2010\)](#)
 - Optional: [Smith and Sorensen \(2000\)](#), [Gale and Kariv \(2003\)](#)
11. Apr. 12: *Student presentations*
12. Apr. 19: *Student presentations*
13. Apr. 26: *Networks and Markets - guest lecture by Sanjeev Goyal*
14. May 3: *Likely no meeting, substituted by extra lecture in Mar. 8 week*

Papers on Networks for Presentation

For your presentation, you can choose from any of the following papers or suggest something not on this list.

- Bargaining
 - [Abreu and Manea \(2009\)](#), [Manea \(2009\)](#)
- Information Diffusion / Non-Bayesian Learning
 - [Golub and Jackson \(2009\)](#), [Golub and Jackson \(2010\)](#)
- Games on Networks
 - [Galeotti, Goyal, Jackson, Vega-Redondo, and Yariv \(2010\)](#), [Campbell \(2009\)](#)
- Strategic Communication
 - [Galeotti, Ghiglino, and Squintani \(2009\)](#), [Hagenbach and Koessler \(forthcoming\)](#), [Stein \(2008\)](#)
- Organization
 - [Baccara and Bar-Isaac \(2008\)](#), [Goyal and Vigier \(2009\)](#)
- Network Formation
 - [Jackson and Rogers \(2005\)](#), [Watts \(2001\)](#)

References

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