# HARVARD UNIVERSITY
# Department of Economics

# ECON 1033
# Fall 2020

## Basic Information

**Course Head**
Prof. Benjamin Golub
Department of Economics
bgolub@fas.harvard.edu and ben.golub@gmail.com

*Office hours*
**Monday: 6:00-7:00pm** via zoom:
https://harvard.zoom.us/my/bengolub

or by appointment

**TA**
Yixi Jiang
Ph.D. Candidate, Department of Economics
yixijiang@g.harvard.edu

*Office hours*
**Wednesday: 5:15-6:15pm** (with 15mins extension if needed) via zoom:
https://harvard.zoom.us/j/96690476854?pwd=MGZScjAzcmpweFBnM1k5R0ZWazlrZz09
(Password: networks)

or by appointment

**Meeting time**
Tuesday, Thursday 6-7:15pm
No recitation

## Course description

Social and economic networks are an essential part of the fabric of modern life. Some examples: the complex trading networks that underlie modern financial markets and supply chains; social media platforms; networks of personal connections that help people find jobs. These networks profoundly affect the economy and society more broadly: for instance, financial interdependencies are critical in economic crises, while rumors on Twitter have come to play a central role in our politics. How can we make sense of these phenomena—as individuals, within companies, and as policymakers? This course teaches models from the economics and statistics of networks that are essential to the task. Topics include the diffusion of information and rumors, racial segregation, and the network origins of recessions. We emphasize how network models relate to key ideas from microeconomics.

## Textbooks and readings

- Required
    - o [**EK**] David Easley and Jon Kleinberg, *Networks, Crowds and Markets*, Cambridge University Press, 2010.
      There is a full-text version available online.
    - o [**J-HN**] Matthew O. Jackson, *The Human Network*, Pantheon, 2019.
- Recommended
    - o [**J-SEN**] Matthew O. Jackson *Social and Economic Networks*. Princeton University Press, 2008.

In addition, course material will include readings from the media, primary research literature, and readings from other books.

## Assignments and evaluation

The assignments and their contributions to the grade are as follows. All assignments should be submitted on Canvas in electronic form by their due dates and times.

- 50% written assignments (due weekly on Wednesday, with some breaks):
    - o quantitative exercises;
    - o short essays;
    - o long essays;
- 20% attendance and active, intelligence participation:
    - o almost every lecture will contain some kind of active-learning activity, which is integral to the course content;
- 30% presentations

Late policy: You may choose **one** written assignment to turn in with an arbitrary delay after accessing the solutions, but you must nevertheless write up solutions in your own words, for 100% credit.

You may choose a **second** assignment to turn in under the same "infinite extension" policy for 88% credit.

No other extension requests will be considered, barring exceptional circumstances communicated to the course staff though the office of the Dean of the College.

# Topics

For each topic, a basic reading list is provided. More readings will be assigned as the course progresses.

## 1. Introduction to the course and basic graph theory

- Required
  - EK Ch. 1, 2
  - J-HN Ch. 1
- Optional
  - J-SEN, Ch. 1, 2, 3

## 2. Viral processes and their relatives

- Required
  - EK Ch. 21
  - J-HN Ch. 3
- Optional
  - J-SEN, Ch. 4, Section 7.1, 7.2

## 3. Networked markets and platforms

- Required
  - EK Ch. 17
- Optional
  - To be announced

## 4. Basic game theory

- Required
  - EK Ch. 6
- Optional
  - J-SEN Section 9.9

## 5. Network games with discrete actions and coordination

- Required
  - EK Ch. 19
  - J-HN Ch. 4, 8

- Optional
  - J-SEN Sections 9.2-9.8
  - Chwe, Michael Suk-Young. *Rational Ritual: Culture, Coordination, and Common Knowledge*. Princeton University Press, 2013.
  - [de Soto, Hernando, "The Real Mohamed Bouazizi," *Foreign Policy*, December 16, 2011](#)
  - [Schelling, T., *Strategy of Conflict.*](#)

## 7. Basic network centrality theory

- Required
  - EK Ch. 13, 14, excluding advanced material
  - HN Ch. 2
- Optional
  - J-SEN Ch. 2

## 8. Propagation through networks: opinions

- Required
  - EK Ch. 16
  - Golub and Sadler [survey](#), Section 3 until the start of Section 3.3
  - J-HN Ch. 7
- Optional
  - J-SEN Ch. 8, especially Section 8.3

## 9. Propagation through networks: Macroeconomics and finance

- Required
  - J-HN Ch. 4
  - Basic reading on Leontief models to be announced
- Optional
  - Carvalho, Vasco M., and Alireza Tahbaz-Salehi. "Production networks: A primer." Annual Review of Economics 11 (2019): 635-663.

## 10. Networks, markets, and inequality

- Required
  - J-HN Ch. 6
  - EK Ch. 10, 11
- Optional
  - J-SEN Ch. 10