

## ECON 291: SOCIAL AND ECONOMIC NETWORKS

### Contact information.

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### Logistics.

Class: MW 11:30-12:20 in Landau 140  
Course website: Canvas

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

**Prerequisites.** This course is aimed at PhD students and researchers who are comfortable with matrix algebra and logical proofs, some basic knowledge of game theory (e.g., Nash equilibria), and who have prior knowledge of statistics/econometrics (e.g., at the first year PhD level). Otherwise, the course is self-contained.

### Grading and assignments.

- Presentations (33%):

In about 2/3 of the classes, we will have a conference-format presentation. The idea is to simulate a presentation at an NBER-like conference. One student (the “author”) will present a pre-selected paper from the syllabus (20 minutes). Another student will be a “discussant” (10 minutes). Then we will have a chance for the rest of the audience to ask questions.

We will randomly (with replacement) assign the roles throughout the term, one week in advance of the presentations. The papers that will be presented/discussed are marked with a *PRES*.

- Paper Proposals (67%): Maximum of 12 pages (more is not better). Due by June 11 at 11:59pm via Canvas.

You may work in groups of up to four for these. This is a short research proposal concerning either the empirical analysis of a social or economic network, a theoretical contribution, or a new method. Given the ten week horizon and other assignments in the course, you will not be expected to produce a paper or even a full-length proposal, but rather an outline regarding the work that you would conduct: (i) basic motivation of why this is interesting and needed, (ii) a description of the research that would be undertaken, (iii) the methods that would be employed and the challenges that would be faced, and (iv) an outline of what steps would be taken to complete the analysis. Thus, it should be well enough thought out to clear motivate and present the ideas and approach, but not a finished piece of research. This will be due at the end of finals week and *should be no longer than 12 pages* (double spaced with 1 inch margins and 12 point type including any figures and references). For a guide to writing a proposal, see: <http://www.stanford.edu/~jacksonm/nsfpost.pdf> This is more of the length of a whitepaper than a proposal, but the guide to a proposal will help you identify the things you need to cover.

### Other course policies.

- *Students with Documented Disabilities*: Students who may need an academic accommodation based on the impact of a disability must initiate the request with the Office of Accessible Education (OAE). Professional staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an Accommodation Letter for faculty dated in the current quarter in which the request is made. Students should contact the OAE as soon as possible since timely notice is needed to coordinate accommodations. The OAE is located at 563 Salvatierra Walk (phone: 723-1066, URL: <http://studentaffairs.stanford.edu/oea>).

**Readings.** The readings for this class are research articles, surveys, chapters, and the text: Matthew O. Jackson (2008) *Social and Economic Networks*, Princeton University Press. The starred\*\* readings are ones are very likely to be covered in lectures and others are less likely, but are related and might be covered in the lectures.

The readings with a *PRES* are the ones that will be presented in class.

### COURSE OUTLINE.

The course will flow (roughly as follows) – but this is a live document and therefore things are subject to change.

## I. Introduction, Fundamentals, Measurements (3 lectures)

- Illustrations, Basic Measurements: Neighborhoods, Diameter, (1 lecture, 4/3)

Readings:

- Jackson (2008, 2019) Chapters 1, 2, 3\*\*
- Bearman, Moody, and Stovel (2004)
- Soramäki, Bech, Arnold, Glass, and Beyeler (2007)
- Ugander, Karrer, Backstrom, and Marlow (2011)
- Milgram (1967)
- Dodds, Muhamad, and Watts (2003)
- Erdős and Rényi (1959, 1960)
- Jackson (2008b)

- Some Economic Networks and more properties: Clustering, Support, Economic Connectedness, Geography (1 lecture, 4/5)

Readings:

- Banerjee, Chandrasekhar, Duflo, and Jackson (2019b)\*\*
- Chetty et al. (2022a,b)\*\*
- Coleman (1988)
- Jackson, Rodriguez-Barraquer, and Tan (2012)

- Centrality and Influence Measures, Friendship Paradox (1 lecture, 4/10)

Readings:

- Jackson (2008) Chapters 1, 2, 3\*\*
- Feld (1991)\*\*
- Borgatti and Everett (1992)
- Bonacich (1972, 1987)\*\*
- Jackson (2019b)\*\*
- Banerjee, Chandrasekhar, Duflo, and Jackson (2013, 2019b)\*\*
- Kearns, Judd, Tan, and Wortman (2009)\*\*
- Bloch, Jackson, and Tebaldi (2022)
- Sadler (2022a)
- Evtushenko and Kleinberg (2021)
- Gallea, Morelli, and Rohner (2022)<sup>PRES</sup>

## II. Network Formation (4 lectures)

- Random networks (2 lectures 4/12, 4/17)

Readings:

- Jackson (2008) Chapters 4 and 5\*\*
- Bollobás (1988)
- Watts and Strogatz (1998)\*\*
- Watts (1999)
- Barabasi and Albert (1999)

- Albert, Jeong, and Barabási (1999)
- Jackson and Rogers (2007)
- Broido and Clauset (2019)<sup>PRES</sup>
- Ruiz-García et al. (2023)<sup>PRES</sup>

- Strategic network formation (2 lectures 4/19, 4/24)

Readings:

- Jackson (2008) Chapters 6 and 11\*\*
- Jackson and Wolinsky (1996)\*\*
- Bala and Goyal (2000)\*\*
- Herings and Zhan (2021)
- Currarini, Jackson, and Pin (2009, 2010)
- Mele (2017)
- Banerjee, Breza, Chandrasekhar, Duflo, Jackson, and Kinnan (2020)
- Friebel, Lalanne, Richter, Schwardmann, and Seabright (2021)
- Mosleh, Martel, Eckles, and Rand (2021)
- Boucher, Tumen, Vlassopoulos, Wahba, Zenou et al. (2020)
- Olaizola and Valenciano (2014, 2018, 2020, 2021)
- Billand et al. (2021)<sup>PRES</sup>
- Bramouille, Goyal, and Morelli (2023)<sup>PRES</sup>

### III. Contagion and Diffusion (2 lectures)

- Contagion, SIS, SIR, Bass (1 lecture 4/26)

Readings:

- Jackson (2008) Chapter 7\*\*
- Jackson and Yariv (2011)
- Jackson and Lopez-Pintado (2013)
- Merlino, Pin, and Tabasso (2020)
- Lee, Lazer, and Riedl (2022)<sup>PRES</sup>

- Diffusion, Identifying seeds (1 lecture 5/1)

Readings:

- Jackson (2008) Chapter 7\*\*
- Golub and Sadler (2016)\*\*
- Banerjee, Chandrasekhar, Duflo, and Jackson (2019b)\*\*
- Beaman, BenYishay, Magruder, and Mobarak (2021)\*\*
- Banerjee, Chandrasekhar, Duflo, and Jackson (2013)\*\*
- Jackson and Storms (2022)
- Akbarpour, Malladi, and Saberi (2017)
- Sadler (2022b)
- Stoica, Han, and Chaintreau (2020)
- Koh and Morris (2022)<sup>PRES</sup>

## IV. Learning and Information Aggregation (3 lectures)

- Bayesian learning, Boundedly Rational Learning, Frictions and Experiments (1.5 lectures, 5/3, 5/8)

Readings:

- Jackson (2008) Chapter 8\*\*
  - Banerjee (1992)\*\*
  - Bikhchandani, Hirshleifer, and Welch (1992)\*\*
  - Golub and Sadler (2016)\*\*
  - Bala and Goyal (1998)\*\*
  - Choi, Gale, and Kariv (2005)\*\*
  - DeMarzo, Vayanos, and Zwiebel (2003)
  - Acemoglu and Autor (2011)
  - Mossel, Sly, and Tamuz (2014)
  - Mossel, Mueller-Frank, Sly, and Tamuz (2020)
  - Board and Meyer-ter Vehn (2021)
  - Bikhchandani, Hirshleifer, Tamuz, and Welch (2021)
  - Sadler (2017)\*\*
  - Banerjee, Breza, Chandrasekhar, and Mobius (2019a)\*\*
  - Grimm and Mengel (2020)
  - Chandrasekhar, Larreguy, and Xandri (2013)
  - Mueller-Frank and Neri (2013)
  - Banerjee, Breza, Chandrasekhar, and Golub (2018)
  - García-Jimeno, Iglesias, and Yildirim (2022)<sup>PRES</sup>
  - Baumann and Dutta (2022)<sup>PRES</sup>
- Speed of Convergence, Information Aggregation, DeGroot Model (1.5 lectures, 5/8, 5/10)

Readings:

- Jackson (2008) Chapter 8\*\*
- Golub and Jackson (2010)\*\*
- Golub and Jackson (2012)\*\*
- Mossel, Sly, and Tamuz (2015)
- Kuchler and Stroebel (2021)
- Sethi and Yildiz (2016)
- Jackson, Malladi, and McAdams (2021)
- Mostagir and Siderius (2022b,a)
- Hirshleifer, Peng, and Wang (2023)<sup>PRES</sup>

## V. Games Played on Networks and Peer Effects (3 lectures)

- Games of Complements, Norms, Peer Effects (1.5 lectures, 5/15, 5/17)

Readings:

- Jackson (2008) Chapter 9\*\*, 13\*\*
- Ballester, Calvó-Armengol, and Zenou (2006)\*\*
- Galeotti, Goyal, Jackson, Vega-Redondo, and Yariv (2010)
- Jackson and Zenou (2014)\*\*
- Jackson and Storms (2022)\*\*
- Centola, Eguíluz, and Macy (2007)
- Centola (2011)
- Manski (1993)\*\*
- Bramoullé, Djebbari, and Fortin (2009)
- Aronow and Samii (2017)
- Athey, Eckles, and Imbens (2018)
- Shalizi and Thomas (2011)
- Manresa (2013)
- Hampole, Truffa, and Wong (2021)
- Sadler and Golub (2021)
- Joshi, Mahmud, and Sarangi (2020)
- Parise and Ozdaglar (2023)
- Bhargava et al. (2022)*PRES*
- Public Goods on Networks (0.5 Lecture 5/17)
  - Readings:
    - Bramoullé and Kranton (2007)
    - Galeotti, Goyal, Jackson, Vega-Redondo, and Yariv (2010)
    - Bramoullé and Kranton (2014)
    - Bramoullé, Kranton, and D’amours (2014)
    - Elliott and Golub (2012)
    - Acemoglu, García-Jimeno, and Robinson (2015)
    - Eubank, Kronick et al. (2021)*PRES*
- Informal Insurance, Exchange, Repeated Games on Networks (1 Lecture 5/22)
  - Readings:
    - Jackson (2008) Chapter 9\*\*
    - Ligon and Schechter (2012)
    - Ambrus, Mobius, and Szeidl (2014)
    - Ambrus, Mobius, and Szeidl (2014)
    - Jackson, Rodriguez-Barraquer, and Tan (2012)
    - Goeree et al. (2010)
    - Leider et al. (2009)\*\*
    - Breza and Chandrasekhar (2016)\*\*
    - Chandrasekhar, Kinnan, and Larreguy (2018)
    - Bloch, Genicot, and Ray (2008)
    - Gallo, Riyanto, Roy, and Teh (2022)*PRES*

## VI. Networked Markets (4 lectures)

- Labor Markets, Homophily, and Inequality (2 lectures, 5/24, 5/31)

Readings:

- Jackson (2008) Chapter 10\*\*
- Granovetter (1973)\*\*
- Montgomery (1991)
- Calvo-Armengol and Jackson (2004, 2007)\*\*
- Bolte, Immorlica, and Jackson (2020)
- Beaman and Magruder (2012)
- Munshi (2003)
- Pallais and Sands (2016)
- McPherson, Smith-Lovin, and Cook (2001)\*\*
- Currarini, Jackson, and Pin (2009, 2010)\*\*
- Chetty et al. (2022a,b)\*\*
- Jackson (2021)
- Buhai and van der Leij (2020)*PRES*
- Egger, Auer, and Kunz (2022)*PRES*

- Financial Networks (1 lecture, 6/5)

Readings:

- Allen and Gale (2000)
- Eisenberg and Noe (2001)
- Gai and Kapadia (2010)
- Elliott, Golub, and Jackson (2014)\*\*
- Acemoglu, Ozdaglar, and Tahbaz-Salehi (2015)\*\*
- Jackson and Pernoud (2021a,b,c)\*\*
- Wang (2017)
- Roukny, Battiston, and Stiglitz (2018)
- Gofman (2017)
- Kanik (2021)
- Czoka and Herings (2023)*PRES*

- Supply Chains, Trade and Network Dynamics (1 lecture, 6/7)

Readings:

- Carvalho and Tahbaz-Salehi (2019)
- Carvalho et al. (2021)
- Acemoglu et al. (2012)
- Chaney (2014)
- Jackson and Kanik (2020)
- Elliott and Jackson (2023)
- Elliott, Golub, and Leduc (2022)*PRES*
- Pellet and Tahbaz-Salehi (2023)*PRES*

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