SOCIAL NETWORKS: THEORY, METHODS AND APPLICATIONS

SOCI 398/898-001
Spring (Jan 12, 2015–May 8, 2015)
Tuesday, Thursday 2:00 PM – 3:15 PM
Teachers College 247
University of Nebraska-Lincoln

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Office Hours: Tuesday 3:30 – 5:30 PM or by appointment

“To speak of social life is to speak of the association between people – their associating in work and in play, in love and in war, to trade or to worship, to help or to hinder. It is in the social relations men establish that their interests find expression and their desires become realized.”

Peter M. Blau  Exchange and Power in Social Life, 1964

“For the last thirty years, empirical social research has been dominated by the sample survey. But as usually practiced, . . ., the survey is a sociological meat grinder, tearing the individual from his social context and guaranteeing that nobody in the study interacts with anyone else in it. It is a little like a biologist putting his experimental animals through a hamburger machine and looking at every hundredth cell through a microscope; anatomy and physiology get lost, structure and function disappear… If our aim is to understand behavior rather than simply record it, we want to know about primary groups, neighborhoods, organizations, social circles, and communities; about interaction, communication, role expectations, and social control.”

Barton 1968, quoted from Freeman 2004

Course Overview
Network analysis is the “study of interaction among social actors” (Freeman 2004). Network analysis has a long history in sociology and anthropology and has experienced a dramatic increase in popularity over the last 15 years. Network techniques are now utilized by a wide range of academic disciplines (including sociology, anthropology, physics, biology, computer science, economics, political science, etc.), as well as by some of the most successful companies in the world (amazon, twitter, google…).

This class offers an introduction to the theoretical, methodological and substantive underpinnings of social network analysis. Network analysis is a unique approach as the focus is on the relationships connecting actors, rather than on the properties of the actors themselves. At its core, network analysis is an approach for studying the social world that recognizes: a) that actors are interdependent, that the behavior of one actor cannot be understood in isolation; and b) that a social system can not be understood based on isolated individual actors-that the whole is larger than the sum of its parts. Just as we cannot understand how an engine works by laying out the pieces of the engine, we cannot understand how the social world works by studying individuals. The key is how the pieces (or actors) are connected.
The class combines theory, methods and substantive applications. The substantive topics are varied and are subject to change, depending on the interests of the class. At minimum, we will cover issues of disease spread, delinquent behavior, power/status, friendship, getting a job, organizational affiliations, and cultural consumption.

Overall, there are three main objectives:
a) learn the theoretical/conceptual ideas at the heart of the network approach
b) learn how to analyze and interpret network data using R, a statistical language and platform
c) learn how to apply network ideas and methods to substantive, social problems.

Prerequisites
There are no formal prerequisites for this class. I will make no assumptions about your mathematical or programming background. You must, however, be willing to learn a little bit of matrix algebra, graph theory and R programming.

Readings
I will often list more papers than we will actually have time to discuss. I hope this will provide you with a good reference list, although I do not necessarily expect you to read every paper for every week (although you are welcome to do so). I have listed the core readings for each week separately from the supplemental readings. You are expected to have read the core readings before class that day.

Format of the class
The class will be a mix of lectures, discussion and labs. It is important that you read the material prior to class. This will ensure that we can have an interesting, dynamic discussion. This is especially important for days where we go over substantive applications. The lectures on these days will be short as I want to allow for a free flowing discussion about the articles. In general, you are expected to be engaged with the material and the class. This means that you should be on time to class, should be not engaged in distracting behavior (e.g. texting), should ask and answer questions, etc. You are also expected to be an active participant during the labs, where we will learn how to apply the ideas presented in class to actual data. The labs will use R to analyze actual network data. The labs will (hopefully) be held in our normal classroom. On such days you must bring a laptop with R installed on it (or be able to remotely connect to a computer with R on it). During the labs you will be given the opportunity to try your hand at an open-ended exercise. You will apply the skill and ideas discussed in class to a particular example. I will then post the answer (or at least my answer) to the problem posed in class the next week.

Text and Software
There are two main textbooks for the class:


These books can be found online for a reasonable price. The remaining reading will come from journal articles and will be posted on blackboard.

The class will make heavy use of R. R is a free programming/statistical platform. It works on windows, mac and linux platforms. You are required to have R installed on your computer. You are also required to have a laptop that you can bring to class on lab days.

**Grading**

*Participation: 20%*

This is a graduate level course and in-class participation is crucial for the class.

*Weekly Response Pieces: 20%*

You will have to write weekly (or so) write-ups in response to the readings assigned for that day. These weekly responses should only be 1 page in length. They are designed for you to think through the readings and to come into class having something to say. This is your opportunity to decide what is interesting about the material and to shape the discussion in the class. This should (ideally) make the in-class discussion smoother. These are not summaries of the articles per se (although you may quickly summarize things if you like) but rather reactions to the articles. You may respond as you feel fit, but here are a number of possible questions you may address in the course of the response:

- What did you find most interesting, challenging or confusing about the article?
- How does the main thrust of the article fit (or not fit) with your own research?
- What did you disagree with in the article?
- Can you think of another substantive or empirical setting where the argument of the article could be applied?

You can respond to all of the articles for the day or focus on one. I will not accept late response papers as they are designed to facilitate in-class discussion. Accepting the papers after the class would defeat that purpose. They are also not a substitute for missing class.

*Research Paper: 50% for actual research paper; 10% for initial submission of results and summary of project*

The main assignment in the course is a research paper, in which you perform an empirical analysis on real network data and write up the results. The research paper must include: an introduction with a substantive/theoretical justification for the project; an analysis of network data; a summary of results; and a conclusion. The hope is that this will be a start to a publishable paper. The paper is due during the scheduled final for the class.

You will also be required to turn in some initial results and a summary of the project a month before the actual paper is due. This is designed to ensure that you are making sufficient progress.
You must include a visualization of the network, summary measures, and a 3 page intro/summary of the project.

I leave it you to decide what question you want to answer, what data you would like to use, etc., but you must get my approval for the project before you begin. I can also help you find data and a research question if you are struggling on your own. We will discuss the researcher paper in more detail during class, including a discussion of possible data sources.

**Key Dates**
Jan 20: 1 page response paper due (this can be in response to the background readings or the readings on data and measurement)
Jan 27: 1 page response paper due
Feb 12: 1 page response paper due
Feb 17: 1 page response paper due
Feb 26: 1 page response paper due
Mar 3: Deadline for getting my approval for your proposed research project. After this date, I will take 1% off your final grade everyday until you discuss your proposed project with me.
Mar 5: 1 page response paper due
Mar 17: 1 page response paper due
Apr 2: Parts of research paper due: visualization of network, summary measures and (at least) 3 page written summary of the project.
Apr 7: 1 page response paper due
Apr 16: 1 page response paper due
Apr 23: 1 page response paper due
May 4 at 3 pm: Final paper is due

**Course policies**
Academic Misconduct (or Don’t Cheat):
“The maintenance of academic honesty and integrity is a vital concern of the University community. Any student found guilty of academic dishonesty shall be subject to both academic and disciplinary sanctions. Academic dishonesty includes, but is not limited to, the following:
Cheating; Fabrication or Falsification; Plagiarism; Abuse of Academic Materials; Complicity in Academic Dishonesty; Falsifying Grade Reports; Misrepresentation to Avoid Academic Work.”
Quoted from the UNL Student Code of Conduct

Disabilities
“It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.”

If you need accommodations it is your responsibility to discuss this with me early on in the semester.

Paper Policy
The research paper must be turned in by the end of the official exam period for the class, stipulated by the university (May 4). There will be no papers accepted after the fact unless there are extraordinary circumstances and the student has received permission from me to turn in the paper late.

Course Schedule (subject to change)

Day 1: Introduction to the Class and Network Analysis (Jan 13)

Day 2: Background and Motivation for Network Analysis (Jan 15)

Required Readings
* Wasserman & Faust: Chapter 1
* Kadushin: Chapter 1
* Borgatti et al. 2009. “Network Analysis in the Social Sciences” Science 323, 892

Supplementary Readings
Freeman, Linton. The Development of Social Network Analysis
Day 3: Data and Definitions (Jan 20)

Required Readings
*Wasserman & Faust: Chapter 2
*Kadushin: Chapter 2

Supplementary Readings
Tamburrini, Nadine, Marco Cinnirella, Vincent A. A. Jansen, and John Bryden. 2015. "Twitter users change word usage according to conversation-partner social identity." Social Networks 40:84-89.

Day 4: Matrix and Graph Representations of Networks and Simple Measures (Jan 22)

Required Readings
*Wasserman and Faust Ch 3&4
*Kadushin Chapters Ch 2&3

Supplementary Readings
Healy, Kieran and James Moody. 2014. "Data Visualization in Sociology." Annual Review of Sociology 40:105-128

**Day 5: Simple Network Measures Continued: Centrality (Jan 27)**

*Required Readings*
* Wasserman and Faust Ch 5

*Supplementary Readings*
Borgatti & Everett. 2006. “A Graph-theoretic perspective on centrality” p466-484 Social Networks
Rossman, Gabriel, Nicole Esparza and Phillip Bonacich. 2010. “I’d like to thank the Academy, Team Spillovers, and Network Centrality” American Sociological Review 75:31-51.

**Day 6: Introduction to R (Jan 29)**
**Day 7: Introduction to R (Feb 3)**
**Day 8: Introduction to R (Feb 5)**

**Day 9: Cohesive Sub-Groups: Theoretical and Technical Introduction (Feb 10)**

*Required Readings*
* Wasserman and Faust Ch 7
* Kadushin Ch 4

*Supplementary Readings*

Day 10 Cohesive Sub-Groups and Embeddedness: Substantive Applications (Feb 12)

Required Readings

Supplementary Readings

Day 11 Groups Norms and Homogeneity Feb (17)

Required Readings
Readings to Skim

Supplementary Readings


Day 12 R lab on Groups (Feb 19)

Day 13: Diffusion Over a Network (Feb 24)

Required Readings
*Kadushin Chapter 9


Supplementary Readings


**Day 14 Diffusion: Substantive Applications (Feb 26)**

*Required Readings*


*Supplementary Readings*

Nicholas A. Christakis. 2010. “Cooperative Behavior Cascades in Human Social Networks” PNAS 107:5334-5338


**Day 15 Small World Phenomena and Diffusion (Mar 3)**

*Required Readings*

*Kadushin Ch 8*


*Supplementary Readings*


Day 16 Small World: Substantive Applications (Mar 5)

Required Readings

Supplementary Readings

Day 17: R day on Diffusion and Small World Networks (March 10)

Day 18: Hierarchy, Balance and Ranked Group Structure (Mar 12)

Required Readings
*Wasserman and Faust Ch 6, 14
*Kadushin Ch 5

Skim

Supplementary Readings

Day 19: Balance and Hierarchy: Substantive Examples (Mar 17)

Required Readings

Supplementary Readings

Day 20 R day on Hierarchy, Balance, and Ranked Groups (Mar 19)

Day 21 Position: Structural and Regular Equivalence (Mar 31)

Required Readings
*Wasserman and Faust Ch 9, 12
*Hanneman Ch 12
Supplementary Readings

Day 22 Positions and Roles: Blockmodels (Apr 2)

Required Readings
*Wasserman and Faust Ch 10, 11

Supplementary Readings

Day 23: Substantive Applications for Roles and Positions (Apr 7)

Required Readings

Supplementary Readings
Day 24: R day on Roles and Positions (Apr 9)

Day 25: Duality: Persons through Groups (Apr 14)

Required Readings
*Wasserman and Faust Ch 8

Supplementary Readings

Day 26: Duality: Substantive Applications (Apr 16)

Required Readings

Supplementary Readings
Day 27: R Day on Duality, Persons through groups (Apr 21)

Day 28 Homophily (Apr 23)

Required Readings


Supplementary Readings


Day 29 (Apr 28) TBD
Day 30 (Apr 30) TBD