PSCI 7381, 28002: Social Network Analysis

Spring 2025

Mondays, 4:00-6:45pm
CB 1.210

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COURSE DESCRIPTION

Scholars have long been interested in the concept of *interdependence* – the reality that social entities (individuals, corporations, and foreign actors, etc.) are mutually dependent on one another for the share of information, goods, and cooperation, among other things. Social network analysis (SNA) focuses on understanding the relationships between social actors and incorporates the realities of an interdependent world; adolescents make decisions in relation to their peer group, world leaders consider the actions of others before engaging in conflict, voters utilize information about political candidates shared from their friends and family, and disease spread through physical contact.

However, the study of interdependence necessitates a new and different set of concepts and analytical tools, beyond those provided in standard quantitative methods training. The primary focus of these methods is the analysis of relational data measured on groups of social actors. This course will **introduce** the various applications, concepts, and methods of social network analysis drawn from social and behavioral sciences, including political science, sociology, public health, and psychology.

COURSE MATERIALS

Students are **required** to rent or purchase the following:

1) Robins, G., 2015. *Doing Social Network Research: Network-based Research Design for Social Scientists*. Sage.

This book may be available through the library website, or you can purchase the paperback version of the book on Amazon. I suggest you rent the book or purchase it used for cost-savings purposes. In addition to the book chapters, I assign scholarly articles that you will be able to access on the course site on eLearning.

GRADING POLICY

First and foremost, students are responsible for doing the assigned readings, attending class, and participating in class discussion. I reserve the right to change the elements of this syllabus if students are not meeting these basic responsibilities.

Your grade for this class will be determined by the following four components:

1. Attendance, Preparation, and Participation (20%)
2. Homework (50%)
3. Group Presentation (10%)
4. Research Paper (20%)

Class Attendance, Preparation, and Participation (20%): Students are expected to attend every class. If you must miss a class, arrangements must be made with me in advance of that class. Students who miss two classes will lose half of their attendance points. Students who miss more than two classes will lose all attendance points.

Students are expected to have completed all required readings for each class and to participate in each class session. Our meetings should be viewed as opportunities for the scholarly exchange of ideas, in which all of us must participate. This is a long class that meets only once a week. To break up our time together, we will follow this loose schedule.

- 4:00-5:30ish: Lecture and discussion
- 5:30-6:45: Homework help, group work, and presentation (if applicable)

Homework (50%): Students will be responsible for completing six homework assignments throughout the semester. These assignments will focus on the data preparation, visualization, and analysis of networks in R. Two of these assignments will be directly tied to your research paper. Specifically:

- Homework #1 (8%): Assigned on 2/10; Due 2/17
- Homework #2 (8%): Assigned 2/24; Due 3/3
- Homework #3, Research Paper and Design Proposal (9%): Assigned 3/10; Due 3/24
- Homework #4 (8%): Assigned 3/31; Due 4/14
- Homework #5 (8%): Assigned 4/14; Due 4/21
- Homework #6, Analyzing Your Network Data (9%): Assigned 4/21; Due 5/5

You are required to use R when completing the homework, final research paper, and in class demonstrations. R is a command-line statistical programming language that is free and open source. It can be operated in Mac OS, Windows, or Linux. R offers an ideal environment for network analysis, but the learning curve to learn the language is steep.

There are a number of free packages available in R for network analysis and visualization. You can download R here: https://cran.r-project.org/. Specifically, I will use R Studio in class, and I encourage you to do so as well. You can download that here: https://rstudio.com/products/rstudio/download/. I'd suggest this tutorial if you are new to R or want a refresher: https://swirlstats.com/students.html.

Additionally, we will learn network analysis in R using:

Luke, Douglas A. 2015. A User's Guide to Network Analysis in R. 1st ed. 2015 edition. Cham Hildesheim New York: Springer.

This book is available for download from UTD's library website (https://utdallas.edu/library/). All homework assignments should be submitted to eLearning before the start of class.

Group Presentation (10%): Giving a concise, engaging presentation is a crucial part of any career. You will be required to give a presentation of an *application* of social networks analysis in Political Science, Sociology, Criminology, Psychology, Public Health, or Public Policy. You will complete presentations in groups of two. These groups will be determined by the professor based on shared substantive interests.

Your group will be required to find an article that *applies* social network analysis to a *substantive* concept that you're interested in. You will present this article to the class by summarizing the main components of the motivation, theory, design, analysis and results of the paper, as well as presenting opportunities for future research and constructive criticism of the work. A good example of an application of social network analysis to the study of Congress is:

> Fowler, J.H., 2006. Connecting the Congress: A Study of Cosponsorship Networks. *Political Analysis*, pp.456-487.

Groups will be assigned no later than the 2/10 class period. Your group will be required to sign up for a specific presentation date. The options are:

- Monday, 2/24
- Monday, 3/10
- Monday, 3/31

Research Paper (20%): Write an original research paper that involves social network analysis. This will start with the formulation of your research question and design (Homework #3). You will be tasked with finding whole network data that can reasonably answer your question(s) or creating your own dataset. Your paper will include analysis of this data and results (Homework #6).

Importantly, like all good research, your paper should be theoretically motivated, and not just motivated by the data that is available. Papers must include an introduction, literature review, theory and expectations, research design, data analysis and results, and a conclusion/discussion sections.

We will spend a lot of time in and outside of class thinking about and formulating your research question. I expect that students will consult with me throughout the process. We will also discuss each other's questions and projects in class.

Finally, I expect that this paper will be original to this course – not submitted as part of a requirement from a different course. I am willing to consider a substantial modification of a paper submitted to another class, but you must consult with me on this first.

The final paper is **due Monday, May 12th** and must be submitted to eLearning.

COURSE POLICIES

Students should familiarize themselves with official UTD course policies and procedures, which can be found here: https://go.utdallas.edu/syllabus-policies

Technology Requirements: No phones allowed. Laptops for notetaking purposes only. I reserve the right to move to paper-only.

No Plagiarism; AI Limited Use Policy: In particular, you should familiarize yourself with the concept of plagiarism – see the "Academic Integrity" section from the link above. Plagiarism is NOT tolerated in this course. If you have any questions about this, ask me before you turn in an assignment or take an exam. *Plagiarism includes reusing work from another course in this course without my explicit, advance permission.*

The use of generative AI (e.g., ChatGPT) is permitted in limited circumstances. You should not use it to generate material, but to improve the material you have already generated. You can use it in a limited capacity to complete your homework assignments, group presentations, and research paper. See "Artificial Intelligence" policy on eLearning for more specific information. Failure to use AI in accordance with this policy constitutes a violation of academic integrity and will be reported to the university immediately.

No Late Assignments: Many assignments are due before class. Unless otherwise arranged with me *prior to* the deadline, late assignments are not accepted and will automatically result in a zero.

Grade Disputes: If you have questions or concerns regarding your grade, you must wait 48 hours after your assignment/paper has been returned to you before contacting me. In an email, you must provide an argument explaining why you believe your grade should be changed. You can request that the I regrade your entire assignment, but I reserve the right to raise your grade or lower it on any part of the assignment.

Communication: In this class, e-mail will be used as a means of communication with students. You are responsible for checking your school e-mail every day for class work and announcements. All e-mails must be sent through your UTD e-mail address. University policy dictates this, and I do not deviate from this. **I will not discuss grades over e-mail; grades can only be discussed face-to-face**.

Citations: Unless otherwise noted, all submitted works (weekly essays, discussion questions, and final paper) must include a bibliography and attribute work appropriately in-text as well. You're welcome to use any citation method you'd like, if you keep it consistent throughout.

Class Organization: This is a long class that meets only once a week. To break up our time together, a 10-15 minute break may be provided around the half-way point of class. This is your opportunity to get up, go to the restroom, stretch, or send a personal e-mail.

BRIEF COURSE OVERVIEW

1. January 27, Class Overview and Introduction
2. February 3, Introduction to Social Network Analysis (SNA)
3. February 10, Concepts and Theories, Part I
4. February 17, Concepts and Theories, Part II
5. February 24, Research Questions and Study Design
6. March 3, Thinking about and Collecting Network Data, Part I
7. March 10, Thinking about and Collecting Network Data, Part II
8. March 17, Spring Break
9. March 24, Ethical Issues in Social Network Research
10. March 31, Network Visualization, Part I
11. April 7, Network Visualization, Part II
12. April 14, Analyzing Social Network Data, Part I
13. April 21, Analyzing Social Network Data, Part II
14. April 28, Limitations of Social Network Analysis
15. May 5, Course Conclusion

COURSE SCHEDULE & READING ASSIGNMENTS

Following this schedule is imperative to your success in this class. You should familiarize yourself with it. While the topics will remain, some of the dates and readings may need to change depending on how much material we are able to go through together. In order to ensure that the class is flexible, this schedule is subject to change. In the cases where it does change, I will communicate it both in class and via e-mail.

Class 1: January 27
Class Overview and Introduction

Readings to be completed before class:

- Robins, 2015: Preface and Chapter 1

Class 2: February 3
Introduction to Social Network Analysis (SNA)

Readings to be completed before class:

- Kadushin, C., 2012. *Understanding Social Networks: Theories, Concepts, and Findings*. OUP USA.; Chapter 1 (Available for download at the library website)
- Luke, Douglas A. 2015. A User's Guide to Network Analysis in R. 1st ed. 2015 edition. Cham Hildesheim New York: Springer.; Chapter 1 (Available for download at the library website)
- Victor, Jennifer Nicoll, Alexander H. Montgomery, and Mark Lubell, 'Introduction: The Emergence of the Study of Networks in Politics', in Jennifer Nicoll Victor, Alexander H. Montgomery, and Mark Lubell (eds), *The Oxford Handbook of Political Networks*, Oxford Handbooks (2017).

Class 3: February 10
Concepts & Theories, Part I

Readings to be completed before class:
- Robins, 2015: Chapter 2
- Kadushin, 2012: Chapters 2 & 3
- Luke 2015, Chapter 2

[Homework #1 Assigned (Luke, 2015: Chapter 2)]

Class 4: February 17
Concepts & Theories, Part II

Readings to be completed before class:
- Kadushin, 2012: Chapter 4
- Heaney, Michael T., 'Theory and Possibilities in Social Network Analysis', in Janet M. Box-Steffensmeier, Dino P. Christenson, and Valeria Sinclair-Chapman (eds), *Oxford Handbook of Engaged Methodological Pluralism in Political Science* (2024).

[Homework #1 Due]

Class 5: February 24
Research Questions & Study Design

Readings to be completed before class:
- Robins, 2015: Chapter 3
- Luke 2015, Chapter 3

[Group Presentation #1]
[Homework #2 Assigned (Luke, 2015: Chapter 3)]

Class 6: March 3
Thinking about & Collecting Network Data, Part I

Readings to be completed before class:
- Robins, 2015: Chapter 4
- Gross, Justin H. and Joshua Jansa, “Relational Concepts, Measurement, and Data” (2018) in *Oxford Handbook of Political Networks*, Victor, Montgomery, & Lubell, eds.

[Homework #2 Due]

Class 7: March 10
Thinking about & Collecting Network Data, Part II

Readings to be completed before class:
- Robins, 2015: Chapters 5 and 6

[Group Presentation #2]
[Homework #3 Assigned]

Spring Break

Class 8: March 24
Ethical Issues in Social Network Research

Readings to be completed before class:
- Robins, 2015: Chapter 7
- Kadushin, 2012: Chapter 11

[Homework #3 Due]

Class 9: March 31
Network Visualization, Part I

Readings to be completed before class:
- Robins, 2015: Chapter 8
- Luke, 2015: Chapters 4-5

[Group Presentation #3]
[Homework #4 Assigned (Luke, 2015: Chapters 4-5)]

Class 10: April 7
Network Visualization, Part II

Readings to be completed before class:
- Luke, 2015: Chapters 4 and 5

Class 11: April 14
Analyzing Social Network Data, Part I

Readings to be completed before class:
- Robins, 2015: Chapter 9
- Luke 2015, Chapters 10-12

[Homework #4 Due; Homework #5 Assigned (Luke, 2015: Chapters 10-12)]

Class 12: April 21
Analyzing Social Network Data, Part II

Readings to be completed before class:
- Luke, 2015: Chapters 10-12

[Homework #5 Due]
[Homework #6 Assigned (Luke, 2015: Chapters 10-12)]

Class 13: April 28
Limitations of Social Network Analysis

Readings to be completed before class:
- Robins, 2015: Chapter 10
- Shalizi, C.R. and Thomas, A.C., 2011. Homophily and contagion are generically confounded in observational social network studies. *Sociological methods & research*, *40*(2), pp.211-239.

Class 14: May 5
Course Conclusion

Readings to be completed before class:
- Kadushin, 2012: Chapter 12

[Homework #6 Due]

Final Research Paper due Monday, May 12th at 11:59pm