POLI:7002:0001 Network Analysis
Tues & Thurs 9:30-10:45 am
143 Schaeffer Hall
Spring 2020

Course Information

Instructor: Dr. Menninga
Office: 311 Schaeffer Hall
Office Hours: Tues 1-4pm, or by appointment
Phone: (319) 335-3835
E-mail: elizabeth-menninga@uiowa.edu
Class Website: `icon.uiowa.edu`

Course Description

At its heart, network analysis is a framework for thinking about the interconnectedness of the world (in our case, the social and political world). The approach tends to treat relationships between individual actors as the basic unit of analysis, with dyads (pairs of actors) and higher-order units (triads, clusters, and other composite structures) replacing the isolated individual as the primary object of study.

This course is a comprehensive introduction to analyzing network data. We will cover network data collection and management, the formulation and expression of network theory, network visualization and description, and models for the statistical analysis of networks. The course will integrate theoretical discussions with practical examples.

Class meetings will typically have the following components: (1) lecture on the main technical points of the week's topic (often statistical/mathematical), (2) computational demonstration in R, and (3) presentations from students. Initial readings are listed in the schedule below, although additional articles may be added. When working with statistical software in class, I strongly encourage you to bring your laptops so you can write (and annotate) your own code.

Prerequisites

While there are no formal requirements, students should feel comfortable learning mathematical statistics. It is assumed that students have a background in linear and generalized linear models.

Course Materials

In this course, we will use a variety of in-print and on-line resources. The following two books are required:

- Prell, Christina. 2012. *Social Network Analysis: History, Theory & Methodology*. Thousand Oaks, CA: Sage Publications, Ltd. (Hereafter: Prell)

- Lusher, Dean, Johan Koskinen, and Garry Robins, Eds. 2013. *Exponential Random Graph Models for Social Networks: Theory, Methods, and Applications*. New York: Cambridge University Press. (Hereafter: ERGM)

Any other readings assigned will be available through the UIowa library or on the class ICON site.

Software

We will be using R in this course as we learn how to implement/interpret different analyses. R is a free, open-source program. Instructions for downloading and setting up R are available on the course website. Additionally, some resources and tutorials are posted to help you get started if you're not already comfortable with R.

I do not assume that you are already an expert in R. Questions are always welcome, but especially don't be shy about asking computation/software questions. Your classmates are learning these commands for the first time too.

Also, take advantage of the Political Science collab! You can use the computers if yours are ever out of commission and you can go to the collab TA's office hours to ask for computing and technical assistance. I'll post Byung-Deuk's office hours to the ICON site.

Course Requirements and Grading

Your grade for the course will be determined by performance in the following areas: problem sets, an article critique/presentation, a method extension presentation, a final paper/poster presentation, and participation. Homework and papers are due at the time specified. Any late assignments will have points deducted at the rate of 10% of the total available points per calendar day unless arrangements are made *prior* to the due date.

Course Grade Breakdown:

- Problem Sets: 30%

- Article Critique: 10%

- Substantive Application Presentation: 10%

- Method Extension Presentation: 10%

- Paper & Poster: 35%

- Participation: 5%

Participation:

Everyone is expected to keep up with the course material and actively engage in class. You cannot participate if you are not present. Therefore attendance is expected. Please contact me as soon as possible if you must be absent. Evaluation of your participation will be based on: evidence that you are well-prepared for class; intelligent, respectful contributions to discussion, especially questions and comments that advance the conversation; asking relevant questions during lecture/software demonstrations; actively participating in software demonstrations; and engaging your colleagues during their presentations by asking thoughtful (constructive) questions. This should be the easiest 5% of your grade. While it is easy to earn these points they are not automatic.

Problem Sets:

There will be a few assignments throughout the semester ($\sim$4). These problem sets will focus on executing topics discussed in class. Often they will require a computing component as well as discussion or interpretation. These assignments will typically be due two weeks after they are posted to ICON. You are welcome to work together on these assignments, but you are each expected to write up and turn in your own answers.

2 questions throughout the semester will be flagged as "practice comp questions". These should be completed **on your own** consulting no one other than me. They are to give you an idea of the type of question that would show up on the methods comp.

All assignments should be uploaded to ICON by the due date. All assignments for this class must be typed. If you dislike using Word to write math equations and create tables, I recommend using LaTeX. Hand-written work can be attached to the end of your assignments, but the answers/interpretations must all be typed.

Answer keys will be posted when an assignment is returned. Once the answer key is posted, late homework will no longer be accepted. Any late assignments will have points deducted at the rate of 10% of the total available points per calendar day unless arrangements are made *prior* to the due date.

Article Critique:

For each class in which substantive articles are listed on the syllabus, students can sign up to write a critique. Students will sign up on the first day of class and the schedule will be posted to ICON. The critique should consider both the strengths and weaknesses of the article(s) in question. What works? What doesn't? What would you like to see changed? Be sure to address the role of networks in the articles(s). This role can be theoretical, substantive, or methodological (or often all three).

Each student must write 1 critique. The critiques should be 2-4 pages (longer is not necessarily better) and are due at the beginning of class on Thursdays (via ICON). The purpose is to get you engaging with networks literatures and thinking critically about the use of networks in social science settings. My articles are just suggestions. You are welcome to suggest different articles. If you would like to critique different articles, you must get them approved by me first. They must be on the topic of the day, but can be from any social science field. If I like the articles you found more than the ones on the syllabus, extra credit points will be awarded! (Encouraging you to find good articles helps me diversify/update my syllabus as well).

Substantive Application Presentation:

On a **different** week from your article critique, you will give a short (5-10 minute) presentation to the class. This presentation will focus on how scholars have used the topic of the week to study social/political questions. This presentation is not a critique so much as evidence you can read and engage with scholars using new methodologies. Presentations will always be given on Thursdays at the beginning of class. Students will sign up on the first day of class and the schedule will be posted to ICON.

In your presentation you should explain/identify the research question, the theoretical argument (if a theory-testing paper), the empirical approach, and interpret the conclusions. Connect it to the broader literature and how this paper builds on what was already known/contributes new knowledge. Then identify core gaps/strengths/limitations/future directions. More details will be found on ICON. For this presentation you should find a paper relevant to your work. Ideally one you plan to cite in your final paper! The only requirement is that it uses/discusses/engages with the topic of the week.

Methodological Extension Presentation:

Certain topics in this class involve a large number of options. For example, there are dozens of measures of centrality. You will never have enough time to learn all of these in the classroom. This means that being able to take what you've learned and build upon it is crucial! Network analysis is growing rapidly and thus this skill will become even more valuable as you move through your career. So, on certain weeks students will sign up to do a presentation on Thursdays. These presentations will present a measure/statistic directly related to those discussed on Tuesday but that hasn't been directly taught. You will explain the new measure/statistic to the class, explain how it relates to those we already know, and show how to execute the measure/statistic in R. More details will be posted to ICON. Students will sign up on the first day of class and the schedule will be posted to ICON.

Paper/Poster Presentation:

Write a paper and make sure it includes networks. The best papers will be ready to present at a conference or (ideally) publish. The paper should be no more than 25 pages (not including Appendices if you have convergence tests or other diagnostics you need to report). All papers are expected to be formatted professionally (please double-space). The focus of the paper can be substantive (using techniques we learned in class to address an unanswered question in your field), methodological (developing a new network technique), or anything in between.

During exam week you will give a conference-style poster presentation. Your poster should be uploaded to ICON at least 2 hours before your poster session. Additional advice on the paper and poster presentation is posted on ICON.

You are strongly encouraged to help each other with the papers and posters, talk over ideas, and edit for each other.

You are expected to turn in a paper that represents solo-authored original research unless given explicit permission otherwise.

Mid-Semester Paper Deadlines:

Throughout the semester, there are some intermediate deadlines for the paper. The main purpose of these are to keep you moving forward with the project while providing opportunities for feedback before the paper is finished.

Paper Topic & Initial Bibliography: Upload to ICON a proposal for your paper by class on Feb 28. Describe the research question, the contribution you're making to the literature, and how network analysis will enhance the project (this should be no longer than 3 pages). Attach an initial bibliography of at least 10 sources with 1 or 2 sentence summaries of how the source relates to your research question. Five of these sources should explicitly incorporate networks *if at all possible*. In addition to looking for sources within the specific substantive literature, also consider work in other literatures that use similar approaches to the one you intend to use. If you cannot find relevant networks sources, indicate where you looked/what literatures you looked at. This proposal will count for 5% of your final paper/presentation grade.

Data Selection & Research Design: Upload to ICON a brief description of the data you will use to explore your research question as well as the type of analyses you intend to run on the data by class by March 10. This description should be 2-3 pages (incorporate brief descriptions of how you will operationalize the main concepts, whether the data is already in network form or will require restructuring, etc). If you have updated or modified your topic since the last deadline, you should briefly include a description of the new topic and contribution as well (in this case you can run longer than 3 pages). This assignment will be 5% of your final paper/presentation grade.

Paper Workshop: On April 23, we will have a paper workshop. Details on the workshop design will be announced as the date nears; for now know that a draft of your paper will be due on April 16. You will provide/receive written comments to/from a few of your colleagues. The draft itself will only be graded in terms of completion, take advantage of this opportunity to incorporate good feedback. The quality of the comments you provide your peers will also count for 5% of your final paper/presentation grade. Failure to submit a draft will result in your inability to participate in the workshop (and, therefore, a grade of 0 for both your draft and your comments). NOTE: while it is early for a complete draft and it's likely you won't have final models run, it's not too early to have the front half of your paper finished. It's also the perfect time to get feedback on how you are capturing the network/measuring key concepts/selecting appropriate models before you spend too much time executing those parts of the paper. So a well-written front half and a well-thought-through research design section would be a great draft for this presentation. Once again this should be easy points but they will not be automatic.

Important Dates

- Critique/Presentations: Varies by student. See schedule on ICON.

- Proposal: Feb. 28

- Data & Research Design: March 10

- Paper Draft: April 16

- Paper Due: Monday, May 11

- Poster: TBA

Other Expectations

Technology: Please turn your mobile phones off or to silent mode before class. Laptops are permitted for class purposes only. If you are using your laptops for notes or readings, sign out of everything else so you can focus on

mastering the material at hand.

Email: Email is a useful way to ask quick questions. However, replying to complicated questions is highly inefficient for both you and me. If you want to talk about something you don't understand, come by my office hours. In general, while I respond to student emails, I prefer to talk in person. Come see me during office hours!

Ask Questions! Often if you have a question one of your classmates does too. Relevant questions are strongly encouraged.

College of Liberal Arts and Sciences Information and Policies for Undergraduates

Absences and Attendance
Students are responsible for attending class and for contributing to the learning environment of a course. Students are also responsible for knowing the absence policies for their courses, which will vary by instructor. All absence policies, however, must uphold the UI policy related to student illness, mandatory religious obligations, unavoidable circumstances, or University authorized activities (https://clas.uiowa.edu/students/handbook/attendance-absences). Students may use this absence form to communicate with instructors: `https://clas.uiowa.edu/sites/default/files/ABSENCE%20EXPLANATION%20FORM2019.pdf`.

Academic Integrity
All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty. Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address (`https://clas.uiowa.edu/students/handbook/academicfraud-honor-code`).

Accommodations for Disabilities
The University of Iowa is committed to providing an educational experience that is accessible to all students. A student may request academic accommodations for a disability (which include but are not limited to mental health, attention, learning, vision, and physical or health-related conditions). A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. Reasonable accommodations are established through an interactive process between the student, instructor, and SDS. See `http://sds.studentlife.uiowa.edu/` for more information.

Administrative Home
The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at `http://clas.uiowa.edu/students/handbook`.

Communication and the Required Use of UI Email
Students are responsible for official correspondences sent to the UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2, k.11).

Complaints
Students with a complaint about a course should first visit with the instructor or course supervisor and then with the Chair of the department or program offering the course; students may next bring the issue to CLAS in 120 Schaeffer Hall. For more information, see `https://clas.uiowa.edu/students/handbook/student-rights-responsibilit`

Final Examination Policies
The final exam schedule is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this information. No exams of any kind are allowed the week before finals. Visit `https://registrar.uiowa.edu/final-examination-scheduling-pol`

Non-Discrimination in the Classroom
UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights policy. For more information, contact the Office of Equal Opportunity and Diversity (`diversity.uiowa.edu`).

Sexual Harassment
Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, please see `https://osmrc.uiowa.edu/`.