COMM 7710: Introduction to Social Networks
Tuesday and Thursday 9:35 - 10:55
Derby Hall 3116

Instructor: Robert Bond, Derby Hall 3072, bond.136@osu.edu

Office Hours: Monday 10-12 and by appointment.

Course Description

This course will focus on the theoretical and methodological bases of social network analysis. The theoretical basis for social network analysis in the social sciences is the interdependence of actors. Our goal will be to understand the nature of the interdependencies and to study regularities within social systems. In this course we will introduce both the substantive and theoretical framework for social network analysis and (some of) the methodological tools by which we can implement network research. By the end of the course, you should (1) know the major theoretical ideas on which network research is based, (2) be able to collect and organize social network data, and (3) be able to analyze and interpret social network data. Because of the dual goals of the course, our time will be split between substantive and theoretical explanations and methodological tools. Each week we will examine readings related to one area of social network analysis and its methodological and statistical applications related to the substantive readings.

All students must be officially enrolled in the course by the end of the second full week of the semester. No requests to add the course will be approved by the Chair after that time. Enrolling officially and on time is solely the responsibility of the student.

Course Materials

- **Textbook:** Luke (2015). *A User's Guide to Network Analysis in R*. Springer Press.
  – note this ebook is available free through the library.
- A USB "thumb drive". Please bring this to class every day.
- Additional, supplementary readings and PDFs distributed by CARMEN, as needed.
- R for Windows or Mac, with the igraph package installed. I will show you how to install R and packages in class.

Requirements

The format of this course is *social*. Science is a *social* activity, so there will be an emphasis on working with, soliciting feedback from, and providing feedback to your peers (including the instructor!). That is, you are expected to come to class having completed the assigned readings and prepared to discuss them, to ask questions, as well as to answer questions from your peers or myself.

The main requirement for the course is a research paper that uses the methods or ideas of social network analysis. This may be either an application of social network analysis to data you have

already collected or collect for this course, or it may be a research design for a project you intend to complete at a later date. At the end of the course we will reserve time for each student to present their research idea to the class and get feedback. Aside from the research paper, you are required to complete a set of homework assignments intended to ensure that you are becoming familiar with the software and analysis techniques introduced in the course.

Leading discussion one week (25%)

Each student will be designated to lead one class discussions (students will typically work in teams). The seminar leaders will circulate by e-mail or CARMEN to class participants five discussion questions by 2pm the day before the class meeting. The seminar leaders will also be charged with introducing the week's topic by starting out class with a 10 minute overview (see attached guidelines). You should hand out copies of your overview the day of class or distribute them electronically. I will be available to discuss your discussion questions – please schedule an appointment and send me a draft of them prior to our meeting.

Homework assignments (25%)

In weeks 3 through 9 there will be a homework assignment assigned to be completed before the next class. These assignments are designed to help you to become familiar with social network methods and tools. The assignments will be composed of both paper and pencil problems as well as exercises using social network software.

In-class presentation of research (25%)

Each student will present in class their research proposal idea for no less than 10 minutes and no more than 12 minutes. These presentations should be designed to give a brief overview of the theoretical background of your proposed research and the data collection methods and analysis you would do. Students are expected to provide feedback on each other's presentations.

Final Paper (25%)

The final paper should be a research proposal for a project that uses social network theory and analysis. The paper should be at least 15 pages, double-spaced. The paper should briefly introduce your topic (1-2 pages), explain the theoretical background you base your research on (4-5 pages), and describe the data collection methods you propose, the analytical methods and tools you would use, as well as what hypotheses you would test. It is important to note that you do not have to actually complete the research you propose. However, I highly recommend that you propose research that is actually feasible to one day complete.

Derivation of Final Grade

My grading system is largely a percentage based system where 90%+ = A, 80% - 90%+ = B, 70% - 80%+ = C, 60% - 70%+ = D, less than 60% = E, and any + or − determinations are based on proximity of your grade to the cutoffs. I reserve the right to modify this system *downward* depending on the distribution of grades. In other words, if only one student exceeds the 90% threshold, but five hit 89%, I may choose to move the cutoff for an A to 89%. There is no curve for the class. You receive the grade you earn regardless of how the class as a whole performs.

Attendance

While there is no formal attendance policy for the course, you are expected to attend each class.

Attending class will best equip you to complete the homework assignments and to be successful when you present and complete your paper. My goal is that the class will be the academic version of fun and that you will want to attend class anyway, but I suggest that you attend even if you think that I have not been successful.

Students with Special Needs

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.

Course Policies and Miscellaneous

I will only give incompletes for compelling, unanticipated, and nonacademic reasons. Late assignments will be marked down the equivalent of a full letter grade for each 24 hour period in which they are late (one hour late = -1 letter, 25 hours late = -2 letters, and so on). I will only make an exception to this policy if 1) you contact me in writing a week in advance to discuss a conflict, or 2) you provide documentation of a severe illness or family emergency that prevented you from completing the assignment on time.

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct http://studentlife.osu.edu/csc/

<u>**Course Outline**</u>

Each of the first 13 weeks, we will meet and spend part of our time discussing readings about that week's topic, and spend part of our time working with data. This second part of the classes focused on data (most Thursdays) will be part demonstration, part lab, so come prepared with questions, ideas, and (if you can) your own data as soon as possible.

Course Schedule:

Week 1 - Course Introduction and Basics of the R environment

Tuesday, January 9
- Course Introduction, meet and greet each other

Thursday, January 11
- Dalgaard Chapter 1

Week 2 - Networks in the Social Sciences I and Computing in R

Tuesday, January 16
- Borgatti et al. (2009) "Network Analysis in the Social Sciences", Science
- Lazer et al. (2009) "Computational Social Science", Science
- Butts (2009) "Revisiting the Foundations of Network Analysis"

Thursday, January 18
- Dalgaard Chapter 2

Week 3 - Networks in the Social Sciences II and the Representation of Network Data

Tuesday, January 23
- Granovetter (1973) "The Strength of Weak Ties", American Journal of Sociology
- Milgram (1967) "The small world problem", Psychology Today
- Newman (2001) "The structure of scientific collaboration networks", PNAS

Thursday, January 25
- Luke, chapters 1-2

Week 4 - Data Collection, notation and Representation

Tuesday, January 30
- Marin (2004). "Are respondents more likely to list alters with certain characteristics?: Implications for name generator data", Social Networks
- Fischer (2009). "The 2004 GSS Finding of Shrunken Social Networks: An Artifact?", American Sociological Review
- Paik and Sanchagrin (2013). "Social Isolation in America: An Artifact", American Sociological Review

Thursday, February 1
- Luke, chapter 3

Week 5 - Network Visualization

Tuesday, February 6
- Tufte (2001) "The Visual Display of Quantitative Information" (selected pages)
- Freeman (2000) "Visualizing Social Networks", Journal of Social Structure
- Read through this documentation and the examples - `http://igraph.sourceforge.net/doc/R/plot.common.html`

Thursday, February 8
- Luke, chapters 4-6

Week 6 - Centrality and actor prominence

Tuesday, February 13
- Borgatti (2005) "Centrality and Network Flow", Social Networks
- Fowler & Jeon (2008) "The Authority of Supreme Court Precedent", Social Networks

Thursday, February 15
- Luke, chapter 7

Week 7 - Group structure

Tuesday, February 20
- McPherson, Smith-Lovin & Cook (2001) "Birds of a Feather: Homophily in Social Networks", Annual Review of Sociology
- Lewis et al. (2008) "Tastes, ties, and time: A new social network dataset using Facebook.com", Social Networks

Thursday, February 22
- Luke, chapter 8

Week 8 - Affiliation networks and bipartite networks

Tuesday, February 27
- Newman (2006) "Modularity and Community Structure in Networks", PNAS
- Zhang et al. (2007) "Community structure in Congressional cosponsorship networks", Social Networks

Thursday, March 1
- Luke, chapter 9

Week 9 - Local structure and Sub-graphs

Tuesday, March 6
- Borgatti and Cross (2003) "A Relational View of Information Seeking and Learning in Social Networks", Management Science
- Padgett and Ansell (1993) "Robust Action and the Rise of the Medici, 1400-1434", American Journal of Sociology

- Eagle, Pentland and Lazer (2009) "Inferring friendship network structure by using mobile phone data"

Thursday, March 8
- Wasserman & Faust, chapters 13-14

Week 10 - Experiments in Networks, Lab and Field

Tuesday, March 20
- Fowler and Christakis (2010) "Cooperative Behavior Cascades in Human Social Networks", Proceedings of the National Academy of Sciences
- Rand, Arbesman and Christakis (2011) "Dynamic social networks promote cooperation in experiments with humans", Proceedings of the National Academy of Sciences
- Nickerson (2008) "Is voting contagious? Evidence from two field experiments", American Political Science Review

Thursday, March 22
- Aral and Walker (2012) "Creating Social Contagion through Viral Product Design: A Randomized Trial of Peer Influence in Networks", Management Science
- Bond et al (2012) "A 61-Million-Person Experiment in Social Influence and Political Mobilization", Nature
- Kramer, Guillory and Hancock (2014) "Experimental evidence of massive-scale emotional contagion through social networks", PNAS

Week 11 - Diffusion and Peer Influence

Tuesday, March 27
- Christakis & Fowler (2007) "The Spread of Obesity in a Large Social Network", New England Journal of Medicine
- Aral, Muchnik & Sundararajan (2009) "Distinguishing influence-based contagion from homophile-driven diffusion in dynamic networks", PNAS
- Centola (2010) "The Spread of Behavior in an Online Social Network Experiment", Science

Thursday, March 29
- Fowler et al (2011) "Causality in Political Networks", American Politics Research

Week 12 - Introduction to ERGM

Tuesday, April 3
- Srivastava and Banaji (2011)"Culture, Cognition, and Collaborative Networks in Organizations", American Sociological Review
- Lee and Monge (2011) "The Coevolution of Multiplex Communication Networks in Organizational Communities", Journal of Communication

Thursday, April 5
- Luke, chapters 10-11

Weeks 13 and 14 - Student Presentations

Tuesday, April 10
- Student presentations

Thursday, April 12
- Student presentations

Tuesday, April 17
- Student presentations

Thursday, April 19
- Student presentations

Guidelines for Leading Discussion

One or two students will introduce the topic each week. This entails critically summarizing the readings and proposing a set of questions or issues that will help structure the discussion. The presentations, approximately 15 minutes in length, are meant to develop seminar communication skills and to encourage participation by all members.

The following "template" provides a sense of what is required.

- Begin your presentation by introducing and motivating the topic. The heading in the syllabus is a good clue but try to go beyond it, indicating, for example, why the topic is important. For example, why is it relevant to discuss visualization of networks? What are the key issues and questions the authors are grappling with? Are there important issues the authors ignore but should also consider? How do these readings relate to/challenge our "standard" views of the topic at hand?

- Review the readings of the week. Succinctly state each author's main argument and findings. What outcomes is each author trying to explain? What variables do they use in explaining these outcomes? How does the article relate to the main themes of the week? Avoid summarizing the details - stick to the most central points. These summaries should be very brief and to the point. They should focus on providing a road-map of the readings not a definitive review of them.

- Handouts or slides are extremely useful. These will help highlight main points and focus attention on areas of debate for further discussion. Keep them simple! As a rule, less is more.

- Close your presentation with a set of discussion questions aimed at getting the discussion going. These are very important, and the more thought you put into them, the better. These might highlight major unanswered (even unasked) questions that the readings do not deal with. What are the authors forgetting? They might tie a weeks readings into earlier themes and readings. They might push on themes some or all of the readings develop. They might explore the empirical evidence the readings bring to bear on their questions. They might suggest ways that the readings challenge existing understandings of networks. In general, your questions should stimulate conversation by focusing the class on some aspect or aspects of the readings that are interesting, contradictory, revolutionary, etc. At the same time, good questions avoid being so broad that they abstract away from the central issues of the readings. Please circulate these by 2pm the day before the class meeting.