Social Networking: Theory and Methods
(Sociology 3412)

Zack W. Almquist
Spring Semester, 2018

Class Schedule

Lecture: 9:45 - 11:00 AM M & W Blegen Hall 255
URL: `http://moodle.umn.edu`
Note: Requires UMN login and registration in class to access.
URL: `http://www.github.com`
Note: Requires github login.

Professor

Name:	Zack W. Almquist
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Teaching Assistant

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Course Objectives

SOC 3412 is an introduction to Social Network Analysis (SNA) and will cover the theory of SNA and its applications to real world phenomena. This course will cover basic methods for collecting, modeling and visualizing human social connections, including applications to social media, public health and politics. The course is divided into five parts, beginning with network thinking and ending with an example of how social networks influence

voting behavior. Over the course of 15 weeks, students will be exposed to how to think relationally, how to visualize social networks, how to collect data on social networks, how to measure and find signal in social networks, and finally how to understand how information/disease/ideas spread over social networks. Finally, the student will also be given the opportunity to acquire competency in basic data management and analysis tasks within the `R` statistical programing environment.

Honors students are expected to demonstrate greater depth of understanding and will do so through an honors project (see section on Honors Requirements for full details).

Prerequisites

There are no formal prereqs for this course.

Course Requirements

Computers

It is not required that students bring their computers/laptops to lecture and lab (if one is owned), but it is *highly* recommended since lecture will make extensive use of the computer software `R`. Computer labs are available on campus, please consult with the office if you have trouble finding the various locations of campus computer labs.

Readings

Weekly readings assignments can be found on the course syllabus. All readings are assumed to be completed before each lecture/seminar. You are expected to read over the class notes each week and make sure you are familiar with the material as the course progresses. Questions are encouraged.

Homework

Homework assignments will normally be administered on a bi-weekly basis and will be due on every other Thursday at 5:00pm via Moodle. Homework assignments are meant to achieve three results: (1) provide practice with the statistical concepts discussed in class, (2) provide practice with the computational and statistical programing language `R`, and (3) provide a chance to demonstrate your mastery of material and highlight areas where more work is needed. You may work in a group, but all write-ups must be done independently. All collaborators should be appropriately cited in your write up and any detailed R code should also be provided.

Homework must be turned in via moodle and will only be accepted in pdf format. A zero grade will be given for any homework not submitted as a pdf. Your lowest homework grade will be dropped.

Labs

Labs are in class assignments and will be graded pass/fail. All weeks that do not have an exam will be accompanied by an in-class lab assignment. Labs must be submitted on Moodle by the hour after class (i.e., 12:00PM). No exceptions will be made. Lowest score is dropped.

Exams

To assess mastery of course material, four in-class exams will be administered over the course of the semester (always on Wednesday). Each exam will be cumulative. The examinations will cover all material presented in lecture and assigned readings. In order to prepare for exams, students are advised to keep up-to-date on reading assignments and to attend lectures regularly. Your lowest exam grade will be dropped.

Honors Requirements

Honors students will meet with the instructor for 30-60 minutes each week outside of class (time TBD). Honors students will be engaged in a Wikipedia project (you will be emailed a link on the first day of class to register for the course). This project will take a total of 12 weeks and will introduce students to the process of editing, adding and generally improving wikipedia. Students will ultimately have the choice of adding or improving a topic in Social Network Analysis, or adding a biography or updating a biography of an influential Social Network Scholar. Each week all honors students will work with the instructor for 30-60 minutes in a seminar fashion to review their progress in the Wikipedia online course and to discuss the article or biography the student intends to develop or improve.

Grading

Homework:	40%
Labs:	10%
Exams:	50%

Lectures, readings, and review sessions are provided for each student's benefit. It is the responsibility of the student to take advantage of these opportunities to acquire and demonstrate mastery of course material, so as to achieve his or her desired grade.

Letter grade assignment

A	93%+
A-	90-92.99%
B+	87-89.99%
B	83-86.99%
B-	80-82.99%
C+	77-79.99%
C	73-76.99%
C-	70-72.99%
D	60-69.99%
F	<59.99%

Required Texts

- David Easley and Jon Kleinberg. *Networks, Crowds, and Markets: Reasoning about a Highly Connected World*. Cambridge University Press.
  `https://www.cs.cornell.edu/home/kleinber/networks-book/networks-book.pdf`
- Zack W. Almquist. *Social Networks with R: Notes for Social Networking*.
  `https://zalmquist.github.io/socialnetworks_notes/`

Readings

Be prepared to discuss all readings assigned at anytime in lecture/seminar.

Required Software

We will be using the `R` statistical programming language. `R` can be downloaded at `http://www.r-project.org/`.

RStudio IDE (Integrated Development Environment) is a software application which facilitates interaction with the `R` statistical programming language. It is often preferred to the GUI (Graphic User Interface) made available through CRAN. You can download it at `http://www.rstudio.com/`.

Recommended: Latex is a word processor and a document markup language. It can be downloaded and installed on Windows (`http://miktex.org/`), OSX (`https://tug.org/mactex/`) or Linux (use the package manager of your choice).

Recommended: A github account is recommended to all students. One can register for a github account at `https://github.com/`. You can find information about how github works with Rstudio at `http://z.umn.edu/rstudiogit`, and github maintains a quite good help-system at `https://help.github.com/`.

Course Policies

Missing Class, etc.

It is expected that each member of the class will attend every lecture/discussion. If there is an appropriate reason to miss class it is expected that the individual will email or discuss in person with the instructor at least one week in advance. For any medical issues please see the UMN website for university policies.

Cheating, etc.

All work is assumed to be your own and all individuals are expected to follow the university policy on cheating and misconduct. If you have any questions please consult the UMN website for university policies.

Class Structure

This class meets for an hour and twenty minutes two days a week for approximately 15 weeks. Lecture will focus on introducing the key methods and theory of modern social network analysis; lecture will include introducing the student to network analysis in `R` in combination with github and Rstudio. Discussion will focus on going over the readings assigned each week.

Assignments

Theme: Networks and Network Thinking

Week 1 (01/15/18-01/17/18): Introduction and Overview

- *Readings:*
  - NCM: Chapters 1 & 2
  - Class Notes: Chapter 2
- *Homework:*
  - Assignment 1

Week 2 (01/22/18-01/24/18): Networks and Connected Thought

- *Readings:*
  - NCM: Chapters 3 & 4

  - Class Notes: Chapter 3
- *Homework:*
  - Due via Moodle before class on 01/24/18

Week 3 (01/29/18-01/31/18): Network Visualizations

- *Readings:*
  - Class Notes: Chapter 4
- *Exam* (01/31/18):
  - Exam 1 on 01/31/18
- *Homework:*
  - Assignment 2

Theme: Data and Measurement

Week 4 (02/05/18-02/07/18): What does network data look-like?

- *Readings:*
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  - Class Notes: Chapter 5
- *Homework:*
  - Due via Moodle before class on 02/07/18

Week 5 (02/12/18-02/14/18): More Visualizations and Graphing

- *Readings:*
  - Class Notes: Chapter 6
- *Homework:*
  - Assignment 3

Week 6 (02/19/18-02/21/18): Collecting Network Data

- *Readings:*
  - NCM: Chapter 14
  - Class Notes: Chapter 7
- *Homework:*
  - Due via Moodle before class on 02/21/18

Week 7 (02/26/18-02/28/18): Network Sampling and Egocentric Data

- *Readings:*
  - Class Notes: Chapter 8
- *Exam* (02/28/18):
  - Exam 2 on 02/28/18
- *Homework:*
  - Assignment 4

Theme: Describing the Network

Week 8 (03/05/18-03/07/18): The Degree Distribution

- *Readings:*
  - Class Notes: Chapter 9
- *Homework:*
  - Due via Moodle before class on 03/07/18

Week 9 (03/12/18-03/14/18):

[*Spring Break*]

- NO CLASS

Week 10 (03/19/18-03/21/18): Other Measures of Centrality

- *Readings:*
  - Class Notes: Chapter 10
- *Homework:*
  - Due via Moodle before class on 03/21/18

Week 11 (03/26/18-03/28/18): Network and Individual Level Statistics

- *Readings:*
  - Class Notes: Chapter 11
- *Exam* (03/28/18):
  - Exam 3 on 03/28/18
- *Homework:*
  - Assignment 6

Theme: Connectivity and Information Passing

Week 12 (04/02/18-04/04/18): Introduction to the Small World Problem

- *Readings:*
  - NCM: Chapter 20
  - Class Notes: Chapter 12
- *Homework:*
  - Due via Moodle before class on 04/04/18

Week 13 (04/09/18-04/11/18): Social Search

- *Readings:*
  - NCM: Chapter 15 & 18
  - Class Notes: Chapter 13
- *Homework:*
  - Assignment 7

Week 14 (04/16/18-04/18/18): Spread of Disease in a Network

- *Readings:*
  - NCM: Chapter 21
  - Class Notes: Chapter 14
- *Homework:*
  - Due via Moodle before class on 04/18/18

Week 15 (04/23/18-04/25/18): Crowds

- *Readings:*
  - NCM: Chapter 16
  - Class Notes: Chapter 15
- *Homework:*
  - Assignment 8

Week 16 (04/30/18-05/02/18): Voting

- *Readings:*
  - NCM: Chapter 23
  - Class Notes: Chapter 16
- *Exam* (05/02/18):
  - Exam 4 on 05/02/18
- *Homework:*
  - Due via Moodle before class on 05/02/18

Week 17 (05/07/18-05/09/18): Finals

- NO FINAL