CSE 316A: Social Network Analysis

Washington University in St. Louis, Fall 2015

Website: www.cse.wustl.edu/~mithunchakraborty/cse316a
Piazza: www.piazza.com/wustl/fall2015/cse316a/home

Instructor: Mithun Chakraborty
email: mithunchakraborty AT wustl DOT edu
Class timing: Mon & Wed 2:30-4:00 PM
Class location: Lopata 101
Office hours: Tue 2:00-4:00 PM
Office location: Bryan 503

Teaching assistants (grading): Cassie Wang (cassiewang AT wustl DOT edu), Michael Liu (m.liu AT wustl DOT edu)

1 Overview

This course looks at social networks and markets through the eyes of a computer scientist. We will look at questions including, "Why are acquaintances rather than friends more likely to get us job opportunities?" and, "Why do the rich get richer?" We begin by studying graph theory (allowing us to study the structure) and game theory (allowing us to study the interactions) of social networks and market behavior at the introductory level. Among other topics, we will study auctions, epidemics, and the structure of the Internet (including web searches). This course examines the intersection of computer science, economics, sociology, and applied mathematics.

2 Prerequisites

CSE 241 (Algorithms and Data Structures) is a nominal requirement for this course. However, all that is needed is familiarity with high-school algebra. Prior exposure to the fundamentals of probability and statistics will also help. The choice of language for programming assignments, if any, is left to the student.
3 Textbook

I will be closely following *Networks, Crowds, and Markets: Reasoning About a Highly Connected World* (Cambridge University Press, 2010) by David Easley and Jon Kleinberg throughout the course. A complete draft of the book is available online for free at


I will not post lecture notes online. However, after every class, I will provide references to parts of the textbook on which the lecture is based as well as links to additional readings, if any.

4 Online resources

The course website is


All major announcements, readings, and homework assignments will be posted here. **I will assume that any information provided or announcement made on this page is known to all students within 24 hours of it being posted.** The student is encouraged to check the website regularly for the latest developments.

We will also make extensive use of piazza for Q&A, discussions, and feedback from students (see below). The link to the course piazza page is


**All students are required to sign up for the course piazza.** I strongly encourage you to post all your questions related to the course to piazza (anonymously if you are not comfortable with sharing your identity) instead of emailing them to me, unless they are of a personal nature. You should also feel free to respond to your classmates’ questions, start a discussion thread, or draw attention to any current event relevant to this course. If I receive (by email or in person) a question or comment that I think might be of interest to the entire class, I will ask you to re-post it to piazza. Note that your active participation in piazza will count towards your final grade (see below). The primary goal of this policy is to encourage the sharing of thoughts and ideas among students.

5 Course organization (tentative)

Classes will mostly be in the lecture and board work format, although I will also use projection occasionally. There will be no recitations. My preliminary plan is to group the topics to be covered into six modules, listed below, each spanning 3-5 lectures.

**Module 1:** Graph Theory

**Module 2:** Game Theory

**Module 3:** Auctions & Markets
Module 4: Information Networks & Web search

Module 5: Network Dynamics I: Information cascades, Rich-get-richer phenomena

Module 6: Network Dynamics II: Small-world phenomena, Epidemics

However, please note that this plan is tentative and may change depending on factors including time constraints and student interest. All announcements in this regard will be posted on the course website and piazza.

6 Grading

Tentatively, there will be a homework assignment at the end of each module. You will have at most six homework assignments. There will also be an in-class mid-term exam in mid-October after the third module, in addition to the final exam at the end of the semester.

The breakdown of the overall score is as follows:

1. Homework assignments: 40%
2. Mid-term exam: 20%
3. Final exam: 30%
4. Class participation (including piazza activity): 10%

The final grade of a student in the course will be determined on a curve.

Homework must be turned in at or before the beginning of class on the due date. Late submissions will NOT be accepted unless the student can furnish appropriate documentation of unavoidable circumstances.

If you are dissatisfied with your assigned score on any piece of work, you can appeal for a regrading within 10 days of the work being handed back to you by submitting a written explanation of why you do not agree with the score, along with the work itself, to the instructor. We will definitely regrade the work, but please remember that the score may increase, decrease, or remain unchanged depending on the discretion of the teaching staff. Repeat grading appeals for the same piece of work will not be entertained.

7 Collaboration and Academic Integrity

Please educate yourself thoroughly on the university’s undergraduate student academic integrity policy available at http://wustl.edu/policies/undergraduate-academic-integrity.html.

For your homework assignments, you are free to discuss problems with other students in this class, but you must write (or type) up the solutions that you intend to submit on your own. You must also write the following clearly on your assignment when you hand it in:
• The names of all the students with whom you discussed the problem.
• Any external source (i.e. books, online resources etc. excluding the textbook and class lectures) that you used in solving the problem.

Collaboration of any kind on any of the exams is strictly forbidden.

If a student is found to have violated the academic integrity policy on an assignment or exam, they will receive no credit for the particular assignment / exam or even harsher penalties depending on the circumstances. If you have any further questions about this policy, please get in touch with the instructor by email or in person.

8 Student feedback

I will be soliciting feedback from students about all aspects of the course (teaching, topics, assignments, grading etc.) throughout the semester. Providing feedback is not required but highly recommended since I might be able to take your suggestions into account for making adjustments to the course.