

**San José State University  
Computer Science Department  
CS286 Section 1, Social Network Analysis, Spring 2018**

### Course and Contact Information

<b>Instructor:</b>	Aikaterini Potika
<b>Office Location:</b>	MacQuarrie Hall 215
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<b>Office Hours:</b>	T 1:30-2:45 pm and Th 9:30-10:15 am or by appointment
<b>Class Days/Time:</b>	TTh 3-4:15 pm
<b>Classroom:</b>	MacQuarrie Hall 233
<b>Prerequisites:</b>	CS 146 (with a grade of "C-" or better in each); or instructor consent.

### Course Format

#### Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Learning Management System course login website at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through MySJSU at <http://my.sjsu.edu> (or other communication system as indicated by the instructor) to learn of any updates.

### Course Description

The rise of the Web and social media has created complex computing systems in which the technological as well as the human-imposed challenges require new approaches. In this course we will study such modern social computer networks, by unifying tools from different disciplines such as computer science, economics and social sciences. We will cover graph theory, game theory and mechanism design, information networks and search, social dynamics, aggregate behavior, ad auctions, voting etc.

### Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

- Master techniques on analyzing social networks.
- Understand how different theories from computer science, statistics, economics and social studies can be applied to social networks.
- Describe network properties and features.
- Model the evolution of social networks and predict behaviors.
- Use network analysis software to generate visualizations and perform analysis.
- Create market strategies based on social network analysis.

## Required Texts/Readings

### Textbook

Networks, Crowds, and Markets: Reasoning About a Highly Connected World, 1st Edition by David Easley (Author), Jon Kleinberg (Author)

ISBN-13: 978-0521195331

ISBN-10: 0521195330

### Other Readings

- Social and Economic Networks, by Matthew O. Jackson, ISBN: 9780691148205
- Social Media Mining An Introduction by Reza Zafarani, Mohammad Ali Abbasi, Huan Liu, ISBN: 9781107018853
- Online resources

### Software

<https://gephi.github.io/>

<http://ccl.northwestern.edu/netlogo/index.shtml>

<https://www.r-project.org/>

<https://networkx.github.io>

**Other resources:** <https://snap.stanford.edu/data/>

### Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on.

**Homework assignments:** individual, regularly assigned will include written problem assignments, and perhaps some online exercises. Solutions will be not posted. The homework is a tool for you to learn the material and prepare for the exams.

**Reading assignments:** Reading assignments will regularly be for the next class (see schedule).

**Quizzes:** Unannounced quizzes (at least 4) may be given during class, each taking about 5 minutes total. These will generally be problems from the reading assignment and/or the homework.

**Group Project:** A programming project of your choice related to the course's topics in groups of two students. Never use any code you find on the web, unless given by me. Penalty for late submission 5% for every 3 days up to 9 days, after that no submission will be accepted. Final presentation at the end of the semester is mandatory.

**Participation:** In-class participation, online polls etc.

**Midterm exams:** There will be two written Midterm exams during the semester.

**Final exam:** One written final exam.

The exams will contain multiple-choice questions, short answer questions and questions that require pseudocode and/or computations.

## Grading Information

### Determination of Grades

Final Grade:

25% Project

10% Homework

5% Participation

10% Quizzes

30% Midterms

20% Final (scheduled Friday, May 18 2:45-5 pm)

Final exam is comprehensive. No extra point options. No make-ups exams except in case of verifiable emergency circumstances.

A+	A	A-	>90
B+	B	B-	>75
C+	C	C-	>60
D+	D	D-	>45
F			<40

### Classroom Protocol

Attendance is highly recommended. Please avoid disturbing the class: turn-off cell phones (or put them on vibrate mode), no text messaging in the class or the exams, **no taking pictures and video**, avoid coming late. You may not publicly share or upload material for this course such as exam questions, lecture notes, or solutions without my consent.

### University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at <http://www.sjsu.edu/gup/syllabusinfo/>

## CS185C Section 2: Social Networks, Spring 2018

The schedule is subject to change with fair notice. Chapters are from textbook.

Lectures	Date	Topic	Chapter
1	1/25	Introduction	Ch 1
2	1/30	Graphs	Ch 2.1–2.5
3	2/1	Graphs	
4	2/6	Centrality, Strong/Weak Ties	Ch 3.1–3.6 and other
5	2/8	Centrality, Strong/Weak Ties	
6	2/13	Community Detection	Other resources
7	2/15	Homophily, Affiliation, Segregation	Ch 4.1-4.5
8	2/20	Positive and Negative Relationships, Structural Balance	Ch 5.1-5.5
9	2/22	Intro to Game Theory	Ch 6.1–6.3
10	2/27	Intro to Game Theory	Other
11	3/1	Nash Equilibrium	Ch 6.4–6.7
12	3/6	Modeling Network Traffic using Game Theory	Ch 8.1–8.3
	3/8	<b>Midterm 1</b>	
13	3/13	Auctions and Markets-	Ch 9.1–9.6, 10.1– 10.210.2
14	3/15	Markets ad strategic interactions	Ch 10.3; 10.4–10.5
15	3/20	Sponsored Search Markets	Ch 15.1–15.8

16	3/22	Sponsored Search Markets	Ch 15.1–15.8 Other
	3/26- 3/30	Spring Break	
17	4/3	Structure of the Web	Ch 13.1-13.5
18	4/5	Link Analysis and Web Search	Ch 14.1–14.6
19	4/10	Information Cascades – Bayes’ Rule	Ch 16.1–16.4,
20	4/12	Information Cascades – Bayes’ Rule	Other
21	4/17	Voting	Ch 23.1-23.3
	4/19	<b>Midterm 2</b>	
22	4/24	Random Graphs, The Small Worlds Phenomenon	Other, Ch 20
23	4/26	Cascading and Influence	Ch 19
24	5/1	Cascading and Influence	Other
25	5/3	Project Presentations	
26	5/8	Project Presentations	
27	5/10	Project Presentations	
		<b>Final exam</b> <div style="border: 1px solid black; padding: 2px; display: inline-block;"> Friday, May 18 2:45-5 pm </div>	