

Course Title Code Semester Hour (T+P)		Credit	ECTS
Social networks CSE 415 Spring 3+0		3	6
Prerequisites CSE 102			
Language of Instruction English			
Course Type (Required /Elective) Elective			
Instructor Assistant Prof. Dr. Mehmet Serkan Apaydın			
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Assistants None			
Goals	The course then invites you to examine the interconnectedness of modern life through an exploration of fundamental questions about how our social, economic, and technological worlds are connected. Students will explore game theory, the structure of the Internet, social contagion, the spread of social power and popularity, and information cascades.		
Learning Outcomes	1. Students will Identify methods for using the tools of graph theory as a basis for studying the Internet and social networks 2. Students shall analyze the processes through which ideas, beliefs, opinions, products, technologies, and social conventions often spread through social networks.		
Assessment Criteria	Assessment Components Weight		
	Midterm	30%	
	Homeworks and project	30%	
	Final	40%	
	TOTAL	100%	
WEEKLY TOPICS AND PREPARATIONS (tentative)			
Weeks	Lecture (tentative)	Notes	
1.	Introduction. Prisoner’s dilemma. Nash equilibrium. Mixed strategies. Traffic equilibrium. Braess’s Paradox. Tolls. Chapters 6,8 and 9.	Module 2 of edx class	
2.	Matching markets, perfect matching, bipartite graphs, market clearing prices (chapter 10) Homework 1 out	Module 3 of edx class	
3.	Chapter 12 Bargaining and power in networks Homework 1 due	Module 3 part II of edx class	

4.	Chapter 13, 14 Intro to web search, link analysis	Module 4 part I of edx class
5.	Sponsored search markets (chapter 15) VCG Procedure, Generalized second price auction, Equilibria	Module 4 part II of edx class
6.	No class (29 October holiday)	

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7.	Review	
8.	Midterm	
9.	Information cascades, Network Effects, Power Laws and rich-get-richer phenomena	
10.	Cascading Behavior in networks	
11.	Small world phenomenon	
12.	Epidemics	
13.	Markets and Information	
14.	Review	

REFERENCES

Main Textbooks

Networks, crowds and markets. Easley and Kleinberg.

<https://www.cs.cornell.edu/home/kleinber/networks-book/>

<https://learning.edx.org/course/course-v1: CornellX+INFO2040x+1T2016/home>

ECTS / WORKING HOUR TABLE

Activities	Number of Weeks	Duration (Hour)	Working Hours
Duration of the Course	14	3	42

Self Study	14	3	42
Exams	2	30	60
Homeworks	5	6	30
Total Hours			174
Total Hours / 30			6
ECTS Credit of the Course			6