

Course Website

Course materials will be posted on the course website:

<http://www.cs.princeton.edu/~smattw/Teaching/cos445sp17.htm>

Course Staff

Instructors	Office	Email
Matt Weinberg	<i>CS Building 317</i>	smweinberg@princeton.edu
Sandra Batista	<i>106, 221 Nassau Street</i>	sbatista@cs.princeton.edu
Teaching Assistants		
Jieming Mao	<i>CS Building 103C</i>	jiemingm@cs.princeton.edu
Jon Schneider	<i>CS Building 243</i>	js44@cs.princeton.edu
Ariel Schvartzman	<i>CS Building 103C</i>	acohenca@cs.princeton.edu
Karan Singh	<i>CS Building 416</i>	karans@cs.princeton.edu
Cyril Zhang	<i>CS Building 417</i>	cxzhang@cs.princeton.edu

Lectures and Precepts

Class	Time	Place
Lecture	T/Th 1:30 - 2:50pm	CS Building 104
Precept P01	Th 7:30 - 8:20pm	CS Building 102
Precept P02	F 1:30 - 2:20pm	Friend 008
Precept P03	F 2:30 - 3:20pm	Friend 008
Precept P04	F 1:30 - 2:20pm	Friend 111

Office Hours

Time	Place	Staff
Monday 2:00-3:00pm	Friend 016	Jon, Karan
Monday 5:30 - 6:30pm	Friend 016	Cyril, Ariel
Tuesday 3:00 - 4:00pm	CS 317	Matt
Tuesday 4:00 - 5:00pm	CS 103C	Ariel
Wednesday 11:00am - 12:00pm	CS 417	Cyril
Wednesday 4:00-5:00pm	CS 103C	Jieming
Thursday 3:00-4:00pm	CS 317	Matt
Friday 4:00-5:00pm	CS 416	Karan

Outline

The primary objective of this class is to develop the necessary skills to solve problems that involve both computation and incentives. Most lectures and assignments will focus on mathematical proofs, but some assignments will require implementation and test your skills in a simulation environment. Below is a tentative list of topics that the course will cover.

- matching markets
- auction design
- basic game theory and equilibrium concepts
- information cascades
- computational social choice
- behavioural game theory
- market design
- fair division
- incentives in cryptocurrencies
- price of anarchy

Reference
materials

- “Algorithmic Game Theory” by Nisan, Roughgarden, Tardos, and Vazirani;
- “Game Theory, Alive” by Karlin and Peres;
- “Networks, Crowds, and Markets” by Easley and Kleinberg;
- “Introduction to Economics and Computation” by Parkes and Seuken;
- “Twenty Lectures on Algorithmic Game Theory” by Tim Roughgarden;
- “Handbook of Computational Social Choice” by Brandt, Conitzer, Endriss, Lang, and Proccaccia;
- Tim Roughgarden’s lecture notes for CS 269I: <http://theory.stanford.edu/~tim/f16/f16.html>.

Grading

- Take-home Midterm I – 15%;
- Take-home Midterm II – 15%;
- Take-home Final – 30%.
- Problem sets – 35%.
- Participation – 5%.

Homework
Policy

- Homeworks will be due on Mondays at 11:59pm, and assigned at least one week prior to the due date. Homeworks will be due approximately every two weeks.
- **You must write up your solutions in isolation** (without collaborators and without external references).
- Unless otherwise specified, you **may** collaborate with any number of other students in the class, or consult outside references to come up with your solutions. But you **may not** take written, typed, or recorded notes during these interactions, and you **may not** write up your solutions in consultation with other students or outside references.
- You **must** list all collaborators or external references consulted for each problem.
- Every student is responsible for their own assignments. These are **individual assignments**. We allow collaborations and reference consultations for their pedagogical value. Violating these rules is a violation of Princeton University Honor Code.
- A portion of each homework assignment may be designated as a *no-collaboration* portion, in which case you **may not** collaborate with other students or consult outside references. You **may** still discuss the problem with course staff.
- There will be several problems in each assignment. You must type the solution to each problem in a separate file. You may use the provided LaTeX templates to type your solutions. Write your *name, assignment number, problem number, names of your collaborators, and outside references consulted* on each solution.
- Handwritten solutions will not be accepted. You must submit your solutions electronically using the CS dropbox service.
- Some assignments and tests will feature a bonus problem. Solving bonus problems will not add to the assignment score, but will be taken into account when deciding on finals grades. Bonus problems will typically not be assigned partial marks.
- Late policy: you may use up to 4 late days throughout the semester, but not more than 2 days on a given assignment. On each instance, you may only use an integer number of late days. Outside of this policy, no late submissions will be accepted.
- Regrade requests: you are encouraged to discuss any grading questions with the teaching staff during office hours. Regrade requests should be submitted in writing within 10 days of the assignment being graded. A regrade request on a problem will cause the entire assignment to be regraded.

Midterms

There will be two take-home midterms. Each will last one week. The format will be similar to homeworks, except **you may not collaborate or consult outside references at all**. You may visit office hours to ask clarifying questions, but the TAs will in general not provide guidance. The midterms will take place roughly from March 6th-12th and April 3rd-9th (exact dates subject to change).