Syllabus

CS 4501/ECON 4730: ***Markets, Mechanisms, and Machines***
University of Virginia, Spring 2020

Meetings: Tuesdays and Thursdays, 9:30-10:45AM, MEC 213.

Prerequisites: Computer Science majors should register for the CS 4501 course, which has CS 2150 as a prerequisite. Economics majors should register for the ECON 4730 course, which has ECON 3010 or 3110 and ECON 3720 or 4720 as a prerequisite.

Communication: Course materials will be posted on the course website: https://uvammm.github.io. We will use slack (https://uvammm.slack.com) for most communications with the class, and encourage you to use it for asking questions and discussions with the course staff and your classmates.

Course Staff and Office Hours

David Evans (Professor of Computer Science) Office hours: TBD

Denis Nekipelov (Professor of Economics) Office hours: TBD

Kyeongtak Do (Economics PhD Student) Office hours: TBD

Cameron Lloyd (CS 4th-year Student) Office hours: TBD

Course Description

This course explores connections between Computer Science and Economics, and aims to develop students who can work in interdisciplinary teams to use techniques from both computer science and economics to solve important societal problems.

Likely topics include causation, statistical machine learning, natural experiments, resource allocation, game theory, auction theory, mechanism design, and privacy.

Assignments

The main assignments for the class will be a series of team projects where students will be grouped into teams of two to four students, including both computer scientists and economists. The project teams and assignments will emulate the work of real interdisciplinary teams at leading companies. It will be the team's responsibility to distribute the tasks, communicate with each other and explain in the project report what part of the project was completed by what team member.

For the final project, students will have an opportunity to define their own open-ended project to answer an interesting question about the world using methods and techniques from the class.

In addition to the project assignments, there will be reading assignments and other preparation assignments for classes, and there may be some individual problem sets or quizzes (we hope that these will not

be necessary, but will use them if it seems like they will be helpful for improving engagement in the class, or if there are students who are not contributing fully to team assignments).

The due dates for the projects are below. Unless specified different, projects will be due at the beginning of class on the due date.

Tuesday, 21 January: Project 1: Predictions from Data (warm-up)
Thursday, 30 January: Project 2: Market Predictions
Thursday, 13 February: Project 3: Allocating Kidneys
Tuesday, 3 March: Project 4: On-Line Auctions

Final Project

Thursday, 19 March: Team and General Idea
Sunday, 29 March: Project Proposal
Thursday, 9 April: Progress Report
23 or 28 April: Final Presentations
Tuesday, 28 April: Final Project Report

Evaluation

Grading will be based primarily on your performance on the projects, with adjustments for outstanding contributions to the class. For team projects, everyone in a team will normally receive the same grade, except in situations where there are problems or where not all team members contribute fully to the project. All students are expected to be present at all the project meetings and presentations.

Grades will be calculated with several different weightings, where your grade is based primarily on whichever weighting results in the highest score. The range of possible weightings is:

– Project 1: 0-5%
– Project 2: 5-15%
– Project 3: 10-20%
– Project 4: 10-25%
– Final Project: 25-75%
– Class Contribution: 0-25%

Spend your energy focusing on what you are learning, instead of worrying about your grade.

Honor

We believe strongly in the value of a *community of trust*, and expect all of the students in this class to contribute to strenghtening and enhancing that community.

As a student at the University of Virginia, you are trusted to be honorable and expected to behave in ways that merit that trust. We take advantage of this trust to provide a better learning environment for everyone. The course will be better for everyone if everyone can assume everyone else is trustworthy, and we start from the assumption that all students at the university deserve to be trusted.

For most assignments in this course, you will be expected to work in a team. We expect you to be honest, fair, and respectful with your teammates, and to contribute fully to your team to the best of your ability. We also expect you to notify the course staff if there are any problems with your team, or if you have teammates that are not behaving honorably.

You will always be expected to credit any collaborators and properly cite any resources you use.

Expectations and Accommodations

If you anticipate any issues related to the format, materials, or requirements of this course, please meet with one of the instructors outside of class so we can explore potential options. Students with disabilities may also wish to work with the Student Disability Access Center to discuss a range of options to removing barriers in this course, including official accommodations. Please visit their website for information on this process and to apply for services online: sdac.studenthealth.virginia.edu.