

Introduction to Economic Design

Econ 149 - Winter 2024

University of California, San Diego

Instructor: Aram Grigoryan, ag@ucsd.edu

In Person Office Hours: Thursday, 2-3pm, San Diego Super Computer Center, E173.

Virtual Office Hours: (by request, Zoom Link will be announced through canvas)

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Office hours: TBA

1 Course Content, Structure, and Materials

The field of Economic Design studies rules, systems, and institutions that implement desirable social outcomes. The field has had a real-life impact in applications ranging from spectrum auctions to school choice and college admissions.

The course is *mathematical* in nature. We will formally define desirable properties for social outcomes, and we will study their logical compatibility (that is, the possibility of achieving all of them simultaneously). The class will be based on definitions, theorems, and proofs.

The field lies in the intersection of economics (game theory), mathematics, and computer science. Despite these overlaps, no prerequisite knowledge is required in these disciplines. The course material will be self-sufficient.

1.1 Lectures

The class will meet on Tuesdays, 5:00 - 7:50pm, Ridge Walk Academic Complex 0115.

The lectures will be your main resource for learning Econ 149. There will be detailed lecture notes, but attendance is crucial for understanding the material. The lectures will be podcasted.

1.2 Notes and Reading

: Lecture notes will be shared before or after the relevant lectures. The lecture notes will not be as detailed as the lectures, but hopefully they will contain the most relevant parts.

Note taking during the lecture may be useful, but not crucial.

There is no required textbook for the class. Some optional chapters and papers will be shared for additional reading.

2 Grading and Exams

Homework: There will be a total of 5 problem sets, each worth 8 points. From each problem set, only one or two questions will be randomly picked and graded. Only the 4 best of the 5 problem sets will count towards the final grade.

Final Exam: 68 points

Homework: 32%

Final Exam: 68%

Grades: There is no established scale for letter grades. Curving will be applied.

3 Important Dates

Final Exam, Thursday, 3/21, 7:00 - 10:00pm, location TBA

4 Exam Policies

Make-up exams: Due to lack of resources, we cannot accommodate make-up exams. All students should take the final exam on the scheduled date, unless of course there is an emergency. In case of an emergency, the student will receive an incomplete grade, which can be completed in the following quarter.

Cheat sheet: You may bring the lecture notes to the exam. No other material is needed or allowed.

5 University Resources

Disability Accommodations. Campus policy regarding disabilities requires that faculty adhere to the recommendations of the Office for Students with Disabilities (OSD). Any student eligible for and needing academic adjustments or accommodations because of disability should submit to me a letter from OSD describing appropriate adjustments or accommodations and should arrange to meet with me as soon as possible so that arrangements can be made in a timely manner. University policies regarding disabilities are available at <http://disabilities.ucsd.edu/students/>. Appointments with OSD (phone or in-person) can be made by calling 858.534.4382 or by email at osd@ucsd.edu. More information can also be found [here](#).

Religious Observance. Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly accommodate all students who, because of religious obligations, have conflict with scheduled examinations, assignments or required attendance. Please, let me know about a potential conflict as soon as possible so that we can reschedule the relevant assignment/examination.

Harassment Policy. The University Policy on Discrimination and Harassment applies to all students, staff and faculty. Any student, staff member or faculty member who

believes that they have been the subject of discrimination or harassment based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation, or political philosophy, should contact the Office for the Prevention of Harassment and Discrimination (OPHD) at (858) 534-8298, ophd@ucsd.edu, or reportbias.ucsd.edu.

Data Privacy. The University adheres to the standards for student privacy rights and requirements as stipulated in the Federal Rights and Privacy Act (FERPA) of 1974, see <http://ucsd.edu/catalog/front/ferpa.html>.

Counseling. Managing the many challenges of being a college student can be very stressful. Always remember that talking to somebody that is professionally trained to help is just an email, or short walk, away: <https://caps.ucsd.edu/>.

6 Tentative Class Schedule

Weeks	Topic
Weeks 1-2	Social Choice and Voting
Week 3	Object Allocation
Week 4	Introduction to Auctions
Weeks 5-7	Two-sided Matching
Weeks, 8-10	Further Topics

7 Learning Objectives

Students will learn important findings in the theory of economic design. Some of these findings have revolutionized our understanding of rules and systems, and have influences policy making in a variety of social choice problems.

In addition to the theory, the goal is to learn how to think like a ‘design economist’ – that is, formulate desirable properties that allocation and social choice outcomes should satisfy, and find rules that can meet these properties. In the class, we will discuss many

real-life applications; students will be encouraged to learn more applications and share them in the classroom.

The course will enhance students' skills of formal mathematical reasoning. Some of the key learning objectives are understanding theorems and proofs, constructing (counter)examples, and evaluating properties of social choice and allocation rules.