Economics 510: Advanced Microeconomic Theory

PROFESSOR

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COURSE

Meetings
Tuesday/Thursday, 2:00pm – 3:15pm
Graham Memorial Hall 0038

Office hours
Wednesday, 1:00pm – 3:00pm (and by appointment)
Gardner 305A

GOALS

This is a course on *market design*: how do we solve allocational problems in situations where markets do not (yet) exist? Examples of such situations include trade among small numbers of individuals, the assignment of medical residents to hospitals, kidney transplants, the allocation of public school seats, voting, and carbon credits. In addition to discussing the rationale behind the methods used to address these problems, we will discuss the problems inherent in applying "classical" markets to these problems; as we will see, many of these problems represent general economic principles, and frequently the best we can do is to minimize the problematic aspects of the allocational mechanism at hand, not eliminate the problems entirely.

To fully consider the implications of market mechanisms, we will take an extended detour into incentives and game theory: how do strategic agents act in the face of important decisions? The study of incentives is the bedrock of modern economic thought, and we will use the first part of the semester to build the tools employed by economic theorists; we will discuss the limitations of these tools and how they map onto real-world situations.

PREREQUISITES

Satisfactory completion of Economics 400 and 410 is formally required to participate in this course. I will assume that you have the following abilities:

- ⊞ Take simple derivatives; e.g., $\partial/\partial x[x^2] = 2x$.
- ⊞ Take simple integrals; e.g., $\int_0^1 x dx = 1/2$.
- ⊞ Compute expected values of random variables; e.g., if X is a random variable distributed uniformly on $[0, 1]$, $\mathbb{E}[X] = 1/2$.
- ⊞ Facility with *some* statistical software; exercises that require a computer should be feasible in Microsoft Excel (or any other spreadsheet software), but you are welcome to use whatever tools you find useful.

If during the course of the semester you are not comfortable with these background concepts, I am happy to help you work through and/or remember them during office hours.

POLICIES

Grading

- ⊞ Recaps (15% total). There will be short weekly recaps of course material, which will be graded on a ✓+/✓/✓− scale; some will be more like traditional problem sets, others will be open-ended.
- ⊞ Midterms (25% total). There will be two midterms; the first will cover content from the first part of the class, and the second will cover content from the second part of the class.
- ⊞ Final (20% total). There will be a *cumulative* final exam.
- ⊞ Term paper (25% for paper, 5% for checkpoints). There will be a 10–12 page term paper, as well as checkpoint assignments to be sure you are on track to successfully complete your term paper. I will provide a set of topics, which will be discussed after the second midterm.
- ⊞ Participation (10% total). This will be measured semi-objectively; see below.

Participation

Throughout the semester I will be using in-class examples to illustrate the concepts we are covering. We will be playing economic games, where the points you earn are for keeps. Here are the rules for participation:

- ⊞ Everyone starts with 50 points.
- ⊞ By participating in class examples, you will have the opportunity to gain points. Later in the semester, you will also have the ability to lose points. *None of this will be done purely at my discretion, and will be subject to well-specified rules and consequences. Some of these consequences may be random.*
- ⊞ At the end of the semester, your number of points will be adjusted: if it is less than zero, it will be set to zero; if it is more than 100, it will be set to 100.
- ⊞ Your participation score is your adjusted number of points, divided by the larger of 75 and the maximum adjusted number of points obtained by your peers, times 100.

Participation points are awarded in this way to accomplish two goals: first, the stakes *relative to your grade* are large enough that you should take our experiments seriously; second, the stakes *relative to the curve* are small enough that you should treat your classmates as colleagues and not as enemies. In previous incarnations of this course, no one's final grade has been adversely affected by the behavior of others.

If you do not participate at all, you are guaranteed at least a 50% participation score. If no one participates at all, everyone gets a 67% participation score. You are welcome to verify these calculations.

Note for Spring 2017: I typically implement these examples using a text message response system. Because our assigned classroom is in a basement without reliable cell reception and all other classrooms are booked during our class time (and because I did not realize this until the semester began), experiments will be temporarily halted while I search for an alternate solution.

Attendance

You are expected to attend all class sessions. With exception to the first week (see below) I will not be taking attendance, so your attending lecture is on a good-faith basis.

Because the 500 courses are frequently oversubscribed, I will be taking attendance during the first week of class, prior to the add/drop deadline. **If there is an active waitlist, any enrolled student who fails to show up for these class sessions will be un-enrolled from the course so that waitlisted students have an opportunity to enroll.** There is no priority list for waitlisted students who attend both of the class sessions during the first week: any student enrolled from this list will be selected at random.

Communication

Class notes will be made available on Sakai.

I will respond to workday emails within 24 hours, and to weekend/holiday emails within 48 hours. As a matter of policy, all emails must contain a salutation, e.g., "Hi [X]." I reserve the right to ignore emails that are not politely begun.

Schedule

Part 1

Introduction; impossibility and motivation; rational behavior; strategies; normal-form games; Nash equilibrium; randomness; mixed strategies.

Part 2

Extensive-form games; credible and non-credible threats; imperfect information; learning and signaling; unraveling and market failure; simple matching models.

Part 3

Applications of market design.