Syllabus

1 Introduction

Econ 467 is a one semester advanced undergraduate course covering topics in game theory and game theoretic topics in information economics. My expectation is that students will differ greatly in their prior exposure to game theory. I have structured my notes accordingly. Because of this range of backgrounds, there are going to be periods in which I talk about topics that many of you already know. But you will find that I move on fairly quickly to material that is new.

2 Prerequisites and Requirements

2.1 Prerequisites

You must know basic probability theory. In particular, you will need to compute conditional probabilities in simple examples, you will need to compute expectations, and you will need to be comfortable with basic probability distributions, the uniform distribution in particular. We will also use a modest amount of calculus, including some very simple integration (on the order of, integrate \( x \)).

If this seems rather elementary, then good; it is elementary. But make no mistake: this is a technical class. Although the technical prereqs are modest, we will, in effect, build up a branch of mathematics, called game theory, from scratch. And I will assume that everyone has an elusive quality called “mathematical maturity.” Mathematical maturity means that you know, or are at least willing to learn, basic mathematical notation such as \( f : A \to B \) and that you have a willingness to grapple with sustained mathematical argument.

2.2 Requirements

The official text is Gibbons (1992). Class notes will, however, be important: I will cover material that is not in the text but that I will nevertheless include on homework and exams.

I have written notes on game theory at my website. These notes are at roughly a first year graduate level, which is somewhat above the level of this course. For example, the proof of the existence of Nash equilibrium, uses mathematical machinery that few if any of you will know. I’m happy to talk about this material with anyone interested but for everyone else, if something in the posted notes seem inaccessibly
mathy, don’t worry about it. The good news is that most of the notes are, or should be, accessible.

Homework will comprise 20% of your grade. Homework will be typically be due on Wednesdays by 5pm in the Department office. I will be assigning homework roughly weekly and some of the questions will be difficult. Points will be deducted if the homework is late. You are encouraged to go to me or the AI, Lintao Ye, for help, which we will be liberal in providing. You won’t have to miss a homework simply because the problems were hard. We cannot, and will not, police whether you talk to each other about the homework but each student must write up their own homework.

There will be two tests. The first test will be in class on (probably) Wednesday October 23. The second will be at the assigned final exam time and place, which is (currently) Monday, December 16, 10:30-12:30. My tests are all structurally the same: five questions, each worth 20%, possibly with subquestions of roughly equal weight (unless noted otherwise). On the exam grades, I will weight them 50:50 or 0:100 (all weight on the final), whichever is better for you on an individual basis. I typically do not assign a letter grade to the first test, partly because I don’t want to make calls on borderline cases in the middle of the semester, but I’ll give you a good sense of where you stand.

We will be using MobLab a new, smartphone-based platform for doing experiments in class. A MobLab subscription costs $25 per student per course, but this will be picked up by the Economics Department for this semester.

In addition to regular class, our AI, Lintao Ye, will be holding an optional recitation session, for going over HW and exams and addressing any other questions. I will post the place and time for this when it has been set up.

3 Texts

The text is Gibbons (1992). As already noted, however, I will not stick to this text in any reasonable sense. In particular, I will cover material that is not in the text and my treatment even of material that is in the text will often be different, sometimes very different, than the text’s. Nevertheless, the text will help provide a floor of knowledge.

Gibbons (1992) is targeted at advanced undergraduates and has become the default for courses such as this one. Tadelis (2013) is at roughly the same level but is somewhat more formal; it is also more comprehensive. Watson (2013) is at a somewhat more intermediate level. For a lively but informal (largely verbal) introduction to many of the main intuitions in game theory, take a look at Dixit and Nalebuff (2010). Another valuable resource is Ben Polak’s online game theory class at Yale, available at Open Yale Courses. Ben’s class uses Watson (2013) as its primary text.

A good resource is Durlauf and Blume (2008), which is an encyclopedia of eco-
nomics. You can access this for free online through the WUStL library. Although I have dated it as 2008, its electronic version is kept updated. I was the original editor for the game theory sections.

The standard graduate level game theory text is Fudenberg and Tirole (1991). A copy will be on reserve. And you should buy your own if you are serious about the subject. Other standard graduate level game theory texts are Myerson (1991) and Osborne and Rubinstein (1994). You may also find useful the game theory sections of standard graduate microeconomics texts, namely Mas-Colell, Whinston and Green (1995), Kreps (1990), and Jehle and Reny (2000), all of which will be on reserve.

For those of you who just can’t get enough advanced material, there are some very good books out on special topics within game theory. Fudenberg and Levine (1998) is a general survey of learning and evolution in games; see also Sandholm (2010) and Friedman and Sinervo (2016). For repeated games and related, see Mailath and Samuelson (2006). For auctions and related mechanism design issues, see Krishna (2009) and Milgrom (2004). For contract theory, see Bolton and Dewatripont (2005).

Finally, as noted earlier, I have my own written notes for basic game theory and for some other topics available at my website.

4 Course Outline

The course will split roughly into thirds. The first part will be spent on basic game theory (some of which won’t be very basic), the second will focus primarily on topics in dynamic games, and the last will cover game theoretic topics in information economics. The actual division of material will not be quite as neat as this; there will be some content overlap between these sections.

5 Help

My office hours will be Tuesdays, 1:30-3. If these hours don’t work for you, let’s find some other mutually convenient time. Just ask.

Office: Seigle 386
e-mail: nachbar@wustl.edu

I hate talking on the phone. Just one of those things. So if you want to reach me, use e-mail.

Our AI is Lintao Ye. His office hours will be Tuesdays, 6:30-8:30pm, Seigle 358. He will also hold an optional recitation section, for going over HW and exams and addressing any other issues, but the place and time for that have not yet been set up.
References


