Economics 712: Topics in Game Theory
Fall 2015

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Office Hours: Tuesdays 2:00-3:30 p.m., and by appointment

Class Time and Place: Thursdays 5:30-8:30 p.m., McNeil 582

We cover various topics in game theory, including common knowledge, hierarchies of beliefs, equilibrium refinements, repeated games, and dynamic mechanism design. The amount of time devoted to each topic is flexible and may be adjusted in response to student interests.

Prerequisites:
Game Theory: Economics 703 or equivalent, e.g., Mas-Colell, Whinston, and Green (1995).
Math: Some familiarity with real analysis, point-set topology, ODEs, and an ability to write simple proofs.

Supplementary Texts: (neither is required)
Fudenberg, D. and J. Tirole, *Game Theory*
Mailath, G. and L. Samuelson, *Repeated Games and Reputations*

Grading:
There will be no final exam. Instead, the grade will be based on three (or maybe two) problem sets. You may work on the problems in groups no greater than three, but you must hand in individual solutions. The members of your group should be listed on your solution.

The goal of this course is not only to teach students the tools of game theory, but also how to communicate using these tools. Accordingly, the solutions to the problem sets must be complete and intelligible. In other words, everything should be written as complete sentences, notation should be properly defined, and small algebraic steps combined. In addition, your solutions must be typed; it will be a good practice, as you have to type your research papers. The font size should be at least 12 point for readability.

Topics:

(1) Knowledge, Common Knowledge, and Almost Common Knowledge

   (a) Common Knowledge
   Chapter 14 of Fudenberg-Tirole, Brandenburger and Dekel (1987a)

   (b) Agreeing to Disagree
   Aumann (1976), Geanakoplos and Polemarchakis (1982)

(c) Common Knowledge of Rationality
Aumann (1987), Brandenburger and Dekel (1987b)

(d) Unawareness
Dekel, Lipman, and Rustichini (1998)

(e) Approximate Common Knowledge
Rubinstein (1989), Monderer and Samet (1989), Cripps, Ely, Mailath, and Samuelson (2008)

(2) Hierarchies of Beliefs, Global Games

(a) Universal Type Space
Mertens and Zamir (1985), Brandenburger and Dekel (1993), Lipman (2003)

(b) Equilibrium Outcomes and Higher-Order Beliefs
Dekel, Fudenberg, and Morris (2006), Dekel, Fudenberg, and Morris (2007), Ely and Peski (2006), Weinstein and Yildiz (2007), Penta (2012), Ely and Peski (2011), Chen, Di Tillo, Faingold, and Xiong (2013)

(c) Global Games
Carlsson and van Damme (1993), Morris and Shin (1998), Morris and Shin (2007)

(3) Repeated Games

(a) Repeated Games with Perfect Monitoring
Fudenberg and Maskin (1986), Sorin (1986), Fudenberg and Maskin (1991), Abreu (1988)

(b) Repeated Games with Public Monitoring
Abreu, Pearce, and Stacchetti (1990), Kandori (1992b), Fudenberg and Levine (1994), Fudenberg, Levine, and Maskin (1994), Levin (2003), Athey, Bagwell, and Sanchirico (2004)

(c) Repeated Games with Private Monitoring
Compte (1998), Kandori and Matsushima (1998), Ely and Välimäki (2002), Ely, Hörner, and Olszewski (2005), Yamamoto (2009)

(d) Community Enforcement
Kandori (1992a), Ellison (1994), Takahashi (2010)

(e) Stochastic Games
Dutta (1995), Hörner, Sugaya, Takahashi, and Vieille (2011)

(f) Continuous Time Games
Simon and Stinchcombe (1989), Bergin and MacLeod (1993), Sannikov (2007), Fudenberg and Levine (2007), Fudenberg and Levine (2009)

(4) Equilibrium Refinements and Robustness

(a) Strategic Stability and Forward Induction
Chapter 11 of Fudenberg-Tirole, Kohlberg and Mertens (1986), Cho and Kreps (1987), Govindan and Wilson (2009)

(b) Robust Mechanism Design and Ex-Post Equilibrium
Neeman (2004), Heifetz and Neeman (2006), Bergemann and Morris (2005), Jehiel, Meyer-ter-Vehn, Moldovanu, and Zame (2006), Oury and Tercieux (2012)

(c) Ex-Post Equilibrium in Repeated Games
Fudenberg and Yamamoto (2010)

(5) Reputation Effects

(a) Bounds on Equilibrium Payoffs
Fudenberg and Levine (1992), Sorin (1999), Gossner (2011)

(b) Impermanent Reputation
Cripps, Mailath, and Samuelson (2004)

(c) Bad Reputation
Ely and Välimäki (2003)

(d) Replacement
Mailath and Samuelson (2001)

(6) Dynamic Mechanism Design

(a) First-Order Approach
Milgrom and Segal (2002), Eso and Szentes (2007), Pavan, Segal, and Toikka (2014)

(b) VCG Mechanism and Balancing the Budget
Bergemann and Välimäki (2010), Athey and Segal (2013)

(7) Evolution

(a) Stochastic Stability
Kandori, Mailath, and Rob (1993), Young (1993), Ellison (1993)

(b) Radius and Coradius
Ellison (2000)

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