Economics 620 Attila Ambrus
Game Theory with Applications
Spring 2019

SYLLABUS

Location of Class: Social Sciences 311
Meeting Time: Mon., Wed. 10.05-11.20 am
Attila's Office hours: Wednesday 1-2.15 pm, Social Sciences 313
Attila's phone and e-mail: 919-660-1835, aa231@duke.edu
TA: TBA
TA's Office Hours: TBA

Text Books

Each of the following books provides a good background reading for the lecture material:

R. Gibbons: Game theory for applied economists, Princeton University Press 1992
ISBN 0-691-00395-5 (PB)

P.K. Dutta: Strategies and Games: Theory and Practice, MIT 1999
ISBN 0-262-04169-3

E. Rasmusen: Games and information: an introduction to game theory, Blackwell Publishing, 2007
ISBN 1-4051-3666-9
(Not printable chapters are available online: http://www.rasmusen.org/GI/index.html)

Grading

Problem Sets	20%
Midterm	30%
Final	50%

Requirements: who should take this course?

This course is an introduction to game theory. For MA students, no formal prerequisite is required. We will use calculus (mostly, one variable) and some probability theory.

Course Aims and Methods

Game theory is a way of thinking about strategic situations. On the one hand its content is normative: it provides guidelines for decision makers to predict others' actions and to recognize good and bad strategies. On the other hand its content is positive: it helps the social scientist to understand the nature of social interaction in various applications, in Economics, Political Science, Sociology and Anthropology. We will learn new concepts, methods and terminology. The course will emphasize examples and applications. We will also play some games in class.

Outline and Reading

The readings are not compulsory, but they will help back up the class material.
G=Gibbons; D=Dutta; R=Rasmusen

Topic 1 (Jan 9) Normal form games: basic concepts; Dominated strategies
Reading G: 1.1.A, 1.1.B; D: 1.1-1.3, 2.3; R: 1.1, 1.2

Topic 2 (Jan 14, 16) Iterated dominance; Best responses; Rationalizability; Knowledge, common knowledge
Reading: G: 1.1.B; D: 2.1, 3-4; R: 1.3, 2.2

Topic 3 (Jan 23, 28, 30) Nash equilibrium; Finding pure strategy Nash equilibria in finite games; Applications: Cournot and Bertrand duopoly, voting games, partnership game
Reading: G: 1.1.C; D: 5; R: 1.4, 3.5, 3.6

Topic 4 (Feb 4, 6, 11) Mixed and correlated equilibria; Large populations; Tipping points; Evolutionary stability
Reading: G: 1.2.A-1.2.B; D: 6-7; R: 5.6

Topic 5 (Feb 13, 18) Extensive form games; Backward Induction; Zermelo's algorithm; Incredible threats; Counter-intuitive predictions of backward induction
Reading: G: 1.3.A-B; D: 8-9; R: 2.1

Topic 6 (Feb 20) Applications: alternative-offer bargaining; Game of duel
Reading: G: 2.1.D; D: 11-12; R: 12.1-12.4

Topic 7 (Feb 25, Mar 4, 6) Imperfect information; Subgame perfect Nash equilibrium: theory and applications; War of attrition
Reading: G: 2.2.A; D: 13; R: 3.2, 4

Midterm: Thursday February 27 (in class)

Topic 8 (Mar 18, 20) Bayesian games; Cournot duopoly with private information; Perfect Bayesian Nash equilibrium and sequential equilibrium

Reading: G: 3.1, 3.2, 4.1; D: 21, 24.2; R: 6.1, 6.2

Topic 9 (Mar 25) Reputation
Reading: G: 4.3.C; R: 5.3-5.4, 6.4

Topic 10 (Mar 27, April 1) Finitely repeated games; Renegotiation; One-step deviation property; Infinitely repeated games
Reading: G: 2.3.A; D: 13-14; R: 5

Topic 11 (Apr 3, 8) Private information; Verifiable information; Costly signaling
Reading: G: 2.3.A, 4.2, 4.3.C; D: 15-18, 24; R: 11

Topic 13 (Apr 10, 15) Auctions: common values and private values; Winner's curse; Revenue equivalence
Reading: G: 3.2.B; D: 23; R: 13

April 17: Review session.