Economics 472:
Introduction to Game Theory
Fall 2005

Instructor: Simon Grant
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Office Hours: Mondays 2:00pm-4:00pm or by appointment.

Classes: Lectures are scheduled for Tu & Th 10:50am-12:05pm Herman Brown Hall 227.
Web Page: http://www.owlnet.rice.edu/%7Eecon472/

Background:


Assessment: The final grade will be based on two mid-term exams (20% each),
a final exam (40%) and problem sets (20%).

If the minimum percentage score earned on either of the mid-term exams or on the
problem sets is lower than the percentage score earned on the final, then that mid-term
exam or the problem sets will not be used in the calculation of the final grade. Instead, the
weight of the final exam will be increased to 60%. That is, the final exam’s weight will be
increased from 40% to 60% only if that improves a student’s overall percentage score.

There will be almost-weekly problem sets. Doing the assignments is important for your
understanding, and therefore shortcuts are not recommended. Sometimes, problems will be
assigned on material not yet covered in class or extends the lecture material; it’s all right
if you make mistakes, you will learn a lot from them. Each student must hand in an
individually written answer to each assignment, but group discussion is encouraged.

Midterms will be held in class on:

Thursday September 15
Thursday November 3

Any student with a documented disability needing academic adjustments or accommoda-
tions is requested to speak with me during the first two weeks of class. All discussions will
remain confidential. Students with disabilities will need to also contact Disability Support
Services in the Ley Student Center.
Course Aims and Methods: Game theory is a way of thinking about strategic situations. One aim of the course is to teach you some strategic considerations to take into account when making your own choices. A second aim is to predict how other people or organizations behave when they are in strategic settings. We will see that these aims are closely related. We will learn new concepts, methods and terminology. A third aim is to apply these tools to settings from economics and other disciplines. The course will emphasize examples. We will also play several games in class.

Outline and Reading: D=Dutta; W=Watson; DN=Dixit-Nalebuff.
A number such as 2.1 refers to Chapter 2, section 1.

Week 1 (Aug 23 & 25)
Introduction.
Prisoners dilemmas; coordination.
Ingredients of Strategic Form Games.
Dominance & Iterative Deletion
Reading. D:1.1-1.3; D:2.3; D:3.1 (except 3.1.2); W:1,6,7; DN:3.1-3.3.

Week 2 (Aug 30 & Sep 1)
Dominance & Iterative Deletion: Applications.
Best Response and Rationalizability: Applications.
Reading. D:2.3; D:3.2-4 ; W:8.

Week 3 (Sep 6 & 8)
Introduction to Nash Equilibrium.
Application: Imperfect Competition.
Reading. D:5,6; W:9; DN:3.4-3.6

Week 4 (Sep 13 & 15)
Nash Equilibrium Applications continued.
First Midterm in class on Thursday.
Reading. D:7; W:10; DN:9.5

Week 5 (Sep 20 & 22)
Nash Equilibrium Applications continued.
Voting; Location.
Introduction to Mixed Strategies.
Reading. D:8; W:11.

Week 6 (Feb 27 & 29)
Mixed Strategies: Applications
Zero-sum games
Reading: 9,10; W: 12; DN:7.
Week 7 (Oct 4 & 6)
  Evolution and Game Theory
  Reading: see Osborne Chapter 13 (especially 13.1 & 13.2).

Week 8 (Oct 13)
  Intro to Sequential Games:
  Backward Induction, Commitment
  Reading. D:11; W:2;

Week 9 (Oct 18 & 20)
  Backward Induction Continued:
  First and second mover advantage,
  Zermelo, Credibility, Reputation.
  Reading. D:11-12, W:21

Week 10 (Oct 25 & 27)
  Duels, Ultimatums, Bargaining.
  Reading. W19

Week 11 (Nov 1 & 3)
  Review class on Tuesday
  Second Midterm in class on Thursday.

Week 12 (Nov 8 & 10)
  Intro to imperfect information
  Information sets, Sub-game Perfection,
  Strategies Applications of SPE: Direct and Strategic Effects
  Reading. D:13; W15-16 (but be selective)

Week 13 (Nov 15 & 17)
  Wars of Attrition.
  Repeated Games: cooperation in Prisoner’s dilemma
  Reading D14; W22 (but be selective)

Week 14 (Nov 22)
  Infinitely repeated games.
  Reading. D15-18; W22-23 (but be selective)

Week 15 (Nov 29 & Dec 1)
  Incomplete Information.
  Applications of Incomplete Information: signaling & screening
  Reading D:19-21,24; W:24-26, 29 (but be selective).