Course Objective: This course is an introduction to game theoretic analysis and its application to social sciences. The main focus is on developing the basic tools of game theory through lectures and exercises and putting these tools to work by applying them to issues that arise in many diverse areas of the Social Sciences such as Economics, Sociology, Political Science, and Law. The ultimate purpose of the course is to provide the students with a set of analytical tools which enables them to explain various social phenomena as the logical outcomes of the individually rational choices made within the given social and economic institutions (i.e., rules of the game) governing the structure of the interactions between the individuals.

Textbooks


Administration

1. Read the assigned materials for each lecture. Do not worry if you do not understand the technical or graphical analyses in the text on your first try. My lectures will help you understand these better. It is important that you grasp the basic intuition behind the principles summarized at the end of each chapter. You may also be required to read some journal and magazine articles that I assign. Some of the questions in the exam will be specifically from these outside readings.

2. Your final grade will be based on one case write-up (*plus* in-class presentation of the case), three problem sets and two written examinations.

   - Case Write-up and Presentation

      (a) The case write-up is worth 20% of your final score for the class.

      (b) The case write-up is designed to give you a chance to apply the ideas developed in class or from the book to a real world example. The example can be taken from your own experience, or from the business or popular press. Be sure to define the players, available strategies for each player, timing of the possible moves, etc. Be precise and use diagrams to illustrate the game. Use the tools developed in the class to specify what the logical outcome (equilibrium) of the game is. Provide a thorough analysis of the game as well as the intuition behind the equilibrium attained. There are two ways to do this: 1)
Take a historical case, do a thorough research on its history and the eventual outcome, and explain the intuition behind the sequence of observed events; 2) Take a current event, collect all relevant information surrounding the case, and make a prediction on what the most likely outcome will be or offer a recommendation for a participant (in the case) on how he/she should play the game. Whichever road you take, be sure to make your arguments using the game-theoretic concepts and tools acquired in class.

(c) You must turn in a less-than-1000-words paper with a less-than-100-words executive summary. Charts, tables, and the executive summary do not count against the 1000-words limit. Each student will be required to present his/her case in class as scheduled in advance. It will be before the submission of the final write-up so that you will have time to incorporate any feedbacks into your final paper.

(d) The final case write-up is due December 8, 2004 (Wednesday). Late submissions will not be accepted.

(e) Grading Criteria: 1) how well you apply the ideas in the chapter to the case; 2) richer and more interesting cases will receive higher grades; 3) the more rigorous the analysis in the paper, the higher the grade; 4) you will be marked down for excessive verbiage and incorrect or irrelevant material, i.e., better written paper will receive higher grades.

- Problem Sets
  * There are three problem sets over the course of the semester. Each problem set is worth 10% of your final score.
  * You will have exactly one week to work on each problem set. Your solution must be turned in at the beginning of the class on the day it is due. Late submission will not be accepted.

- Written Examinations
  Mid-Term (20% of your final score): In-Class, October 18 (Monday)
  Final Exam (30% of your final score): 8:30 - 10:30 AM, December 15 (Wednesday)

3. Weights toward your final grade: Case write-up (20%) + Problem Sets (30%) + Mid-term (20%) + Final (30%) = 100%
Lecture Topics

1. Introduction
   - Topics: Basic Ideas and Examples
   - Readings
     - D&S, Chapter 1.
     - D&N, Chapter 1.

2. Single Person Decision-Making with Perfect and Imperfect Information
   - Topics: Decision Tree, Utility, Rational Choice, Probabilities, Expected Utilities, Rational Choice with Expected Utility
   - Readings
     - D&S, Chapter 2 and pp. 221-232.

3. Strategic Games
   - Topics: Decisions versus Games, Classifying Games, Structure of the Game
   - Readings
     - D&S, Chapter 2

4. Games with Sequential Moves (Anticipating Your Rival’s Response)
   - Topics: Game Trees, Looking Forward and Reasoning Backward, Rollback Equilibrium (Subgame Perfect Equilibrium)
   - Readings
     - D&S, Chapter 3.
     - D&N, Chapter 2.

5. Simultaneous-Move Games with Pure Strategies I: Discrete Strategies
   - Readings
     - D&S, Chapter 4.
     - D&N, Chapter 3.

6. Simultaneous-Move Games with Pure Strategies II: Continuous Strategies
   - Topics: Price Competition, Cournot Quantity Competition, Political Campaign Advertising, Rationalizability
• Readings
  – D&S, Chapter 5.

7. Combining Sequential and Simultaneous Moves

  • Topics: Games with Both Simultaneous and Sequential Moves, Changing the Order of Moves in a Game, Change in the Method of Analysis, Three-Player Games
  • Readings

8. Simultaneous-Move Games with Mixed Strategies I: Zero-Sum Games

  • Topics: Mixed Strategy, Mixing When One Player Has Three or More Pure Strategies, Mixing When Both Players Have Three Strategies
  • Readings
    – D&S, Chapter 7.
    – D&N, Chapter 7.

9. Simultaneous-Move Games with Mixed Strategies II: Non-Zero-Sum Games

  • Topics: Mixing Sustained by Uncertain Beliefs, Non-Zero-Sum Mixing with Three Strategies
  • Readings
    – D&S, Chapter 8.

10. Uncertainty and Information

  • Topics: Asymmetric Information, Cheap Talk, Signaling and Screening, Incentive Payments, Inferring Probabilities from Observing Consequences, Controlling and Manipulating Risk.
  • Readings
    – D&S, Chapter 9

11. Strategic Moves

  • Topics: Credibility, Commitments, Threats and Promises, Acquiring Credibility
  • Readings
    – D&S, Chapter 10
    – D&N, Chapters 5 and 6
    – Schelling, Thomas C., The Strategy of Conflict, Chapter 5: Enforcement, Communication, and Strategic Moves

12. Prisoners’ Dilemma, Repeated Games, and Cooperation

  • Topics: Prisoners’ Dilemma, Repeated Game, Real World Dilemmas
• Readings
  – D&S, Chapter 11
  – D&N, Chapter 4

13. Collective-Action Games

• Topics: Collective-Action Games with Two Players, Collective-Action Problems in Large Groups, Solving Collective-Action Problems, Spillovers (Externalities)

• Readings
  – D&S, Chapter 12
  – D&N, Chapter 9
  – Shepsle and Bonchek, Chapter 10: Public Goods, Externalities, and the Commons

14. Evolutionary Games

• Topics: Prisoners’ Dilemma, Chicken, Assurance Game, Interactions across Species, Hawk-Dove Game, Evolution of Cooperation and Altruism

• Readings
  – D&S, Chapter 13
15. Game Theory and the Law

- Topics: Simultaneous-Move Game and Tort Law; Sequential-Move Game and Contract Law; Information Revelation, Disclosure Laws, and Renegotiation; Signalling, Screening, Non-verifiable Information, and Legal Rules
- Readings

16. Brinkmanship: The Cuban Missile Crisis

- D&S, Chapter 14
- D&N, Chapter 8

17. Voting

- D&S, Chapter 15
- D&N, Chapter 10
- Shepsle and Bonchek, Chapter 6: Strategic Behavior: Sophistication, Misrepresentation, and Manipulation.
- Shepsle and Bonchek, Chapter 7: Voting Methods and Electoral Systems.

18. Bidding and Auction

- D&S, Chapter 16


- D&S, Chapter 17
- D&N, Chapter 11

20. Markets

- D&S, Chapter 18
References


