Course Objective:

In recent decades formal models have become standard analytical tools in the social sciences. As a result, it is increasingly important for students of the social sciences to acquire at least a basic familiarity with formal methods. This course is intended to provide a serious introduction to the major formal approaches in rational choice theory. Rational choice theory breaks down roughly into two general approaches – social choice theory and noncooperative game theory. This course will focus primarily on noncooperative game theory, but we will touch briefly on social choice theory and spatial modeling (initially derived from social choice theory). By the end of the semester, students should be at a skill level that allows them to be intelligent consumers of applied game theoretic research as found in the major disciplinary journals and to construct basic models for applied research. I do not presuppose mathematical proficiency, however a working knowledge of probability theory and calculus will prove beneficial.

Course Evaluation:

There will be two take-home exams and a final project. Also, several problem sets will be assigned. Each exam is worth 30%, the final project is worth 30%, and the problem sets will make up the remaining 10% of the final grade. The first exam will be distributed on October 18 and the second one on November 29. Students are to return the exams to me by the beginning of the subsequent
session. The final project is to be submitted to me no later than 5 p.m. on December 16. Barring extraordinary circumstances, I will not accept late assignments or exams. Students are welcome to work in groups on the problem sets, but every student must hand in his/her own copy of the solutions. Students, however, are not permitted to collaborate with their peers on the exams. Anyone found guilty of cheating on exams will receive no credit for the exam, and may be subject to further disciplinary action.

Readings:

There is one required text, available at the Temple University Bookstore or on-line:


On occasion we may draw on outside readings, which I will post on Blackboard. In addition, it may be helpful to subsidize the primary text with other readings. Some useful alternative texts include (listed roughly in order of increasing complexity):


Course Schedule:

The schedule of topics, readings, and assignments are listed below. All readings and assignments are to be completed by the date listed. The instructor reserves the right to alter this schedule in a timely fashion according to the progress of the class.
Week 1. Introduction (8/30)

Games with Perfect Information

Week 2. Strategic Games and Nash Equilibrium (9/6)
Osborne: Chapters 1-2, and 3.3-3.4
Assignment: Problems 31.1, 34.2, and 42.2

Week 3. Mixed Strategies (9/13)
Osborne: Chapter 4
Assignment: Problems 110.1, 114.3, and 127.2

Week 4. Extensive Games I (9/20)
Osborne: Chapters 5-6
Assignment: Problems 173.3 and 177.1

Week 5. Extensive Games II (9/27)
Osborne: Chapter 7
Assignment: Problems 183.4, 211.1, and 221.2

Week 6. Coalition Games and the Core (10/4)
Osborne: Chapter 8
Assignment: Problems 245.1, 245.2, and 247.1

Games with Imperfect Information

Week 7. Bayesian Games (10/11)
Osborne: Chapter 9
Assignment: 282.1 and 307.1
*First Exam Distributed (Due 10/18)

Week 8. Extensive Games I (10/18)
Osborne: Chapter 10.1-10.5
*First Exam Due

Week 9. Extensive Games II and Review (10/25)
Osborne: Chapter 10.7-10.9
Assignment: Problems 331.1, 331.2, 346.1, and 350.2

Evolutionary Games

Week 10. Evolutionary Equilibrium (11/1)
Osborne: Chapter 13
Assignment: Problems 409.2 and 416.1
Repeated Games

Week 11. Repeated Prisoner’s Dilemma (11/8)
Osborne: Chapter 14
Assignment: Problems 442.1 and 445.1

Week 12. General Results (11/15)
Osborne: Chapter 15
Assignment: Problems 454.2 and 459.1

Week 13. No Class – Fall Break (11/22)

Social Choice Theory

Selected readings
*Second Exam Distributed (Due 12/6)

Week 15. Catch-up and Project Discussion (12/6)
*Second Exam Due

*Final Projects Due (12/16)