This course is an introduction to the modern development of the theory of games. Students are expected to know calculus, especially optimization and differentiations, and probability theory. However, I will emphasize the interpretation and the application of formal results. Willingness to learn new material and patience to take care of details are essential to go through this class.

- **Textbook.**
  The main textbook is

  **An Introduction to Game Theory** by Martin J. Osborne
  whose manuscript is on reserve in the undergraduate library. I will circulate sections of the manuscript as needed.

- **Recommended Readings**
  2. Avinash Dixit and Barry Nalebuff [DN]: *Thinking Strategically*, Norton
  3. Avinash Dixit and Barry Nalebuff [DN]: *Art of Strategy*, Norton
8. R. Duncan Luce and Howard Raiffa: Games and Decisions, Wiley
9. Howard Raiffa: The Art and Science of Negotiation, Belknap

- **Course Material.** I will supplement the textbook from other sources. Sometimes, there will be hand-outs and reading assignments. You may find the material and the announcement from


and its links. This is a private link so that only those who are affiliated with uiuc.edu can access. You will need VPN available from CITES in order to access this site from the outside of uiuc.edu domain.

- **Course Evaluations.**

1. **Examinations.** Except for the final examination that covers the whole material, each examination covers the material delivered since the previous examination in order to check whether you understand the material properly.

2. **Participation.** Students are strongly encouraged to actively participate in the class instead of just listening to the lecture. I will ask many questions to students, and expect them to answer properly.

3. **Grade.** The grade will be based on the weighted average of all examinations. The final examination will be assigned higher weight than the other examinations, whose weight will be determined according to the frequency of the examinations in the class. If a student misses the final examination or any one of the other examinations, then his/her grade will be automatically F. Students who miss more than 1/3 of classes or miss more than
two home works will be not qualified for the final examination, and will get F.

4. **Make-up Examination.** To be fair, all students are expected to take examinations at the same time. Generally, students are discouraged from taking the make-up instead of the regular examination.

5. **Re-grading.** If you have complaints regarding the results of an examination or a quiz, you should submit your complaints in writing. After reviewing a written complaint, your entire examination will be graded again, and the result will be final.

6. **Some advice.** Students are expected to attend the entire class. It is not allowed to leave the class during the lecture without my prior permission. I offer no private make-up session. If a student’s behavior is found disruptive, I will ask him/her to leave the class immediately so that the other students can focus. If disruptive behavior continues after repeated warnings, the student will be asked to drop the course.

7. **Office hour.** My office hour is from 2:00 to 3:00 on Wednesday. If you want to see me sometime other than the regular office hour, simply stop by my office. It might be more convenient to make an appointment before you come. Questions through electronic mail or phone may not be answered in a timely manner.
Outline of Course

1. Decision theory
   (a) John von Neumann and Oskar Morgenstern
   (b) Optimization under uncertainty

2. Normal form game
   (a) Strictly competitive game
   (b) Value
   (c) Dominant strategy
   (d) Nash equilibrium
   (e) Trembling hand perfect equilibrium
   (f) Correlated equilibrium
   (g) Applications

3. Dynamic game with complete information
   (a) Subgame perfect equilibrium
   (b) Sequential bargaining
   (c) Repeated games
   (d) Games with imperfect information
   (e) Sequential equilibrium
   (f) Applications

4. Games with incomplete information
   (a) Bayesian Nash equilibrium
   (b) Mechanism design problem
   (c) Signaling games
   (d) Refinement of sequential equilibrium
   (e) Applications

5. Games played by boundedly rational players
   (a) Evolutionary models
   (b) Games played by automata