

# **ECON 199 (GT3) Fall 2017**

## **Intro to Game Theory and Economic Incentives**

University of Illinois at Urbana-Champaign  
College of Liberal Arts & Sciences  
Department of Economics

Instructor: Bei Yang

E-mail: [beiyang2@illinois.edu](mailto:beiyang2@illinois.edu)

Course Website: <http://compass2g.illinois.edu/>

Lectures: MW 3:30pm – 4:50pm, 206 David Kinley Hall

Office Hours: Mondays 11:00am – 12:00pm, or by appointment.

All office hours are held in 17 David Kinley Hall. Please email me at least one day in advance for appointments.

### **Course Description:**

Game Theory studies the interactions between people, corporations, institutions, or countries in which each player recognizes their strategic interdependence with the other players in the game. Many economic decisions in the real world have such strategic interdependence. This course uses game theory as the fundamental concept to examine the economic incentives in real-world applications, e.g., climate change, political elections, management-labor relations, auctions etc. The first part of the course introduces fundamental tools and concepts in game theory as well as some of the most basic games. More advanced topics are covered in the second part of the course, which enables students to analyze more realistic games. Finally, in the third part, students are introduced to the fundamental ideas of mechanism design by studying auctions and bargaining. Through the study of this course, students are expected to be able to analyze and solve basic games. In addition, this course is designed to provide students with tools for modelling real world economic situations, as well as analyzing the strategic consideration and economic incentives involved in those situations.

Prerequisite: There is no strict prerequisites for this course. However, basic courses in economics (e.g., Econ 102 or Econ 103) are recommended. Students should be comfortable with working with basic function maximization and basic probability theory, although no prior knowledge on these topics are assumed.

### **Course Materials:**

Textbook: Games of Strategy, by Dixit, Skeath and Reiley (4<sup>th</sup> Edition) (Required)

Course notes: Lecture slides for each week's lectures will be posted on the course website on Sundays. You are recommended to bring a printed copy of the lecture slides to classes.

## **Communication and Announcements:**

Please feel free to send me an email if you have any general questions regarding the course, and/or conflicts and emergencies. However, you are encouraged to come to my office hours or to make an appointment with me if you have specific questions (e.g., questions about the problem sets, exam problems, etc.), since I do feel that it is easier for us to discuss these questions in person.

Announcements will be made on the course website and emails will be automatically sent to your university email address by the compass2g system. I will assume these announcements are read in a reasonably timely manner. Therefore, please make sure to visit the course website as well as to check your university email inbox regularly.

## **Course Format:**

We will spend most of the time in classes on lecturing and discussions. Some interactive games (e.g., the Climate Action Gaming Experiment) will also be conducted in class. Grade for this course will be determined by attendance, problems sets, exams.

## **Course Grade:**

The following are the weights assigned to each activity in the course:

|                 |     |
|-----------------|-----|
| Attendance      | 5%  |
| Problem sets    | 30% |
| Midterm Exam I  | 20% |
| Midterm Exam II | 20% |
| Final Exam      | 25% |

The grade for each activity is calculated separately (see the corresponding sections for details). The total grade for this course will then be calculated at the end of this semester using the above weights. The scale used to assign letter grades in the course will be established by me at the end of the semester. A "+/-" scale will be used. The cut-offs for letter grades and the "+/-" will also be established at the end of the semester. Grades will be posted in the gradebook of the course website.

## **Attendance:**

Your participation in the class is important, both for your own learning experience and that of your classmates. You are encouraged to ask and answer questions during lectures. We will also do group activities and experiments together. Plan on attending the class regularly.

The attendance will be checked several times through the entire semester. The grade for Attendance is determined by the percentage of attendance from these checks. Four absences are automatically excused with or without any notice in advance.

## **Problem Sets:**

Problem sets will be assigned through the course website. Each problem set has a total score of 100. The grade for Problem Sets will be determined by the average score, after dropping TWO lowest at the end of the semester.

About seven problem sets will be assigned after each major topic of the course. The total number of problem sets may be adjusted according to the actual progress of the course. You will have one week to finish each problem set (i.e., problem set assigned on Monday will be due on the next Monday in class; assigned on Wednesday will be due on the next Wednesday in class). You need to submit your problem sets in class on the due day. No late submission is accepted.

You may discuss the problem sets with your classmates, however, you need to write up your own answers by yourself.

## **Exams:**

Formats of the exams will be announced on the course website one week before the exam date. The two midterm exams will be held in class on October 9<sup>th</sup> and November 15<sup>th</sup> respectively. Since these exams are held during regular class time, no conflict exam would be scheduled. You need to send me an email BEFORE the exam starts for any emergencies, and the grade weight for the missed exam will be moved to the final exam; Otherwise, you will be assigned zero for the missed exam.

The following materials are allowed for use during the exam: graphing calculator, accounting calculator or four-function calculator. There are to be no books, no papers other than the exam itself, no cell-phones or other items that connect to the internet. Students found to be using unapproved items are in violation of the Academic Integrity policy of the University and will be subject to disciplinary action.

### **Final Exam Conflict Policy**

The final exam location and time will be announced both in class and through the course website once it is determined. You need to follow the university's final exam policy to be qualified for the conflict exam. The university's final exam policy is available at [http://studentcode.illinois.edu/article3\\_part2\\_3-201.html](http://studentcode.illinois.edu/article3_part2_3-201.html) . Requests for conflict exam must be sent to me by the last day of instructions on December 13<sup>th</sup>.

## **Reading and Practice Questions:**

The required reading will be assigned after each lecture through the course website. The reading is not to be graded. However, it is very important for you to spend time on the reading and reviewing lecture slides to be prepared for the problem sets and exams.

A version of practice exam and additional practice questions will be posted on the course website one week before each exam. These practices are completely optional, and they are only for practicing, not indicating the actual content of the exams (the format though, will be roughly the same).

### **Academic Integrity:**

“The University has the responsibility for maintaining academic integrity so as to protect the quality of education and research on our campus and to protect those who depend upon our integrity. It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.”

In other words: Do not cheat. Do not help someone else to cheat. Are you unsure about what counts as cheating? Our university’s standards of academic integrity specify that “ignorance is not a defense”! You can inform yourself about standards of academic integrity, and penalties for violating those standards, by consulting the Code of Policies and Regulations.

### **Accommodations:**

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to [disability@uiuc.edu](mailto:disability@uiuc.edu).

Please come to my office hours or make an appointment with me to discuss possible accommodations in class and for assignments. In particular, accommodations for exams can only be provided if requests are made at least ONE WEEK BEFORE the exam date.

### **Emergency Response Recommendations:**

The university maintains guidelines for emergency responses. A list of recommendations when to evacuate and when to find shelter are available at:

[http://illinois.edu/cms/2251/general\\_emergency\\_response\\_recommendations\\_8\\_16\\_13\\_final.docx](http://illinois.edu/cms/2251/general_emergency_response_recommendations_8_16_13_final.docx)

Floor plans for specific buildings are available at:  
<http://police.illinois.edu/emergencyplanning/floorplans/>

## **Tentative Schedule of Topics:**

| Week | Date   | Topics  |
|------|--------|---|
| 1    | Aug 28 | Introduction to the Course                        |
|      | Aug 30 | How to Think about Strategic Games                |
| 2    | Sep 4  | Labor Day (No Class)                              |
|      | Sep 6  | Games with Sequential Moves I                     |
| 3    | Sep 11 | Games with Sequential Moves II                    |
|      | Sep 13 | Simultaneous-Move Games: Discrete Strategies I    |
| 4    | Sep 18 | Simultaneous-Move Games: Discrete Strategies II   |
|      | Sep 20 | Function Maximization                             |
| 5    | Sep 25 | Simultaneous-Move Games: Continuous Strategies I  |
|      | Sep 27 | Simultaneous-Move Games: Continuous Strategies II |
| 6    | Oct 2  | Combining Sequential and Simultaneous Moves       |
|      | Oct 4  | Review Session                                    |
| 7    | Oct 9  | Midterm Exam I (In Class)                         |
|      | Oct 11 | Climate Action Gaming Experiment                  |
| 8    | Oct 16 | Basic Probability Theory                          |
|      | Oct 18 | Risk Attitudes and Bayes' Theorem                 |
| 9    | Oct 23 | Simultaneous-Move Games: Mixed Strategies         |
|      | Oct 25 | Uncertainty and Information I                     |
| 10   | Oct 30 | Uncertainty and Information II                    |
|      | Nov 1  | Strategic Moves                                   |
| 11   | Nov 6  | Strategy and Voting I                             |
|      | Nov 8  | Strategy and Voting II                            |
| 12   | Nov 13 | Review Session                                    |
|      | Nov 15 | Midterm Exam II (In Class)                        |
| 13   | Nov 20 | Thanksgiving Vacation (No Class)                  |
|      | Nov 22 |   |
| 14   | Nov 27 | Bidding Strategy and Auction Design I             |
|      | Nov 29 | Bidding Strategy and Auction Design II            |
| 15   | Dec 4  | Bargaining I                                      |
|      | Dec 6  | Bargaining II                                     |
| 16   | Dec 11 | Mechanism Design                                  |
|      | Dec 13 | Review Session                                    |
|      | Dec 14 | Reading Day                                       |
|      | TBA    | Final Exam  |