

# Economics 308, Game Theory

**Term:** Spring 2023

**Instructor:** Tayfun Sönmez, *e-mail:* sonmezt@bc.edu, *Office:* Maloney Hall, Room 383

**Office Hours:** Fridays 11:00-12:30 PM via zoom by appointment.

**Teaching Assistant:** Vaibhav Ojha, *e-mail:* ojhav@bc.edu,

**TA Office Hours:** Mondays and Wednesdays 3-4:30 PM at Maloney Room 384.

## Course Objectives:

Strategic thinking is the art of outdoing an adversary, knowing that the adversary is trying to do the same to you. All of us must practice strategic thinking at work as well as at home. Businessmen and corporations must use good competitive strategies to survive. Politicians have to devise campaign strategies to get elected, and legislative strategies to implement their visions. Parents trying to elicit good behavior from children must become good strategists. The science of strategic thinking is called game theory. This course is an introduction to game theory. Tools of game theory will be presented via simple examples and real-life applications. Applications include, competitions between firms, strategic voting, incentives, sports competitions, auctions, college admissions, cost sharing, kidney allocation, bankruptcy laws, etc.

## Course Materials:

- A. Dixit, S. Skeath and McAdams, *Games of Strategy* 5th Edition, Norton. (DS&M)
- P. Young, *Equity: In Theory and Practice*, Princeton University Press. (Y)
- Lecture notes (LN), exercises and sample exams. Available both at the Canvas course page and at Instructor's web page:

<http://www.tayfunsonmez.net/teaching/teaching-econ308/>

**Course Format:** This course is offered in an in-person format, and cannot accommodate students who are fully online.

**Grades and Requirements:** Students are expected to come to each class, read the assigned material and solve the homework questions as scheduled.

*Homework assignments:* There will be four homework assignment sets. Answers to homework assignments will not be collected. Solutions are available in Canvas. There is also an additional question set similar to each homework. They also have solutions in Canvas. Please note that, following each homework assignment there will be a quiz where at least one question will be similar to those in the homework. Therefore it is in your best interest to solve them before looking at their solution sets.

*Quizzes:* There will be 4 quizzes each of which will be announced at least one week before the quiz. The worst quiz will be dropped and therefore quiz grades will be based on the best 3 quizzes. Quizzes will cover the material covered in class as well as questions solved in homework assignments.

*Grading:* Grades will be based on quizzes (12%), two midterms (30% and 28%), and a final exam (30%). The dates for the two in-class midterms are: Tuesday, February 28th and Thursday, March 30th. The final exam date/time set by the university is Tuesday, May 9th at 9 AM. (We will only use the first 75 minutes of the allotted final exam time). Students are expected to take the exams in their scheduled times.

### **Course Outline:**

- Part 1: Strategy
  - Introduction to Strategy (DS&M Ch. 1, Ch. 2, LN)
  - Extensive Form Games (DS&M Ch. 3.1, LN)
  - Sequential Games and Backwards induction (DS&M Ch. 3.2-3.6, LN)
  - Simultaneous Games, Dominant and Dominated Strategies, Nash Equilibrium (DS&M Ch. 4, Ch. 5.1, LN)
  - Nash Equilibrium and Subgame Perfect Nash Equilibrium in Extensive Form Games (DS&M Ch. 6, LN)
  - Repeated Games (DS&M Ch. 10, LN)
  - Mixed Strategies (DS&M Ch. 7, LN)
  - Cooperation and Coordination (DS&M Ch. 11, LN)
  - Voting (DS&M Ch. 16, LN)
  - Incentives (DS&M Ch. 15, LN)

- Part 2: Equity
  - Introduction to Equity (Y Ch. 1, LN)
  - Equity and Priority (Y Ch. 2, LN)
  - Apportionment (Y Ch. 3, LN)
  - Bankruptcy Problems (Y Ch. 4, LN)
  - Cost Sharing (Y Ch. 5, LN)

### **Statement on Academic Integrity from the College of Arts and Sciences:**

The College [of Arts and Sciences] expects all students to adhere to the accepted norms of intellectual honesty in their academic work. Any forms of cheating, plagiarism, or dishonesty or collusion in another's dishonesty is a fundamental violation of these norms.

CHEATING is the use or attempted use of unauthorized aids in any exam or other academic exercise submitted for evaluation. This includes data falsification; the fabrication of data; deceitful alteration of collected data included in a report; copying from another student's work; unauthorized cooperation in doing assignments or during an examination; the use of purchased essays, term papers, or preparatory research for such papers; submission of the same written work in more than one course without prior written approval from the instructor(s) involved; and dishonesty in requests for either extensions or papers or make-up examinations.

PLAGIARISM is the deliberate act of taking the words, ideas, data, illustrative material, or statements of someone else, without full and proper acknowledgment, and presenting them as one's own.

COLLUSION is assisting or attempting to assist another student in an act of academic dishonesty.

As part of your scholarly development, you must learn how to work cooperatively in a community of scholars and fruitfully utilize the work of others without violating the norms of intellectual honesty. You have a responsibility to learn the parameters of collaboration and the proper forms for quoting, summarizing and paraphrasing.

Faculty members who detect any form of academic dishonesty have the responsibility to take appropriate action. The faculty member also has the responsibility to report the incident and penalty to the Department Chairperson and the appropriate Class Dean. The report will remain in your student file until you graduate.

If the gravity of the offense seems to warrant it or if the faculty member prefers that another academic authority decide the matter, he or she may refer the case to a Dean. In addition, if the

student is unwilling to accept the faculty member's decision, he or she may choose to have the matter adjudicated either by an Associate Dean or by an Administrative Board. The section of the College of Arts and Sciences in the Boston College Undergraduate Catalogue has further details about this process. Academic integrity is a very important matter. If you have any questions in any of your courses about what is allowed or not allowed, please discuss the matter immediately with the instructor.

**Disability Statement:**

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services through Suzy Conway, Ph.D., LICSW, Assistant Dean for Students with Disabilities, Office of the Dean for Student Development, Boston College, 21 Campanella Way, Suite 212, Phone: 617-552-3470, TTY: 617-552-2548, Fax: 617-552-3473, Email: [suzy.conway@bc.edu](mailto:suzy.conway@bc.edu). Also see <http://www.bc.edu/offices/odsd/disabilityservices.html>.