

**[ECON3308- Game Theory in Economics : credits-3]
Woods College of Advancing Studies, Boston College
Spring 2023, Session #01 May 17-Jun 28**

Instructor Information

Instructor: Ira Lilian Abraham

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Office Hours: By appointment, *Virtual*

Course Description

This course is an introduction to game theory. Game theory consists of a coherent set of concepts and analytical tools to examine interactive or strategic situations between people, that is, situations where the well being of one actor depends not only what s/he does but also on what others do. Hence in deciding how best to act, each person needs to consider how others are likely to act as well. Game theory has become a widely used tool of analysis in a wide range of disciplines, including economics, business, political science, law, and international relations.

Course Format

Asynchronous

Textbook: Strategy: An introduction to Game Theory by Joel Watson (ISBN-10: 0393123871 ISBN-13: 978-0393123876)

Readings and Learning Resources (Required):

All articles/handouts will be available in Canvas unless otherwise noted.

Other Textbooks & Readings (Recommended)

Strategies and Games: Theory and Practice by PK Dutta (ISBN 10: **9780262041690** ISBN 13: **978-0262041690**)

Multimedia Resources

- Recorded Lectures by the course instructor.

Canvas

Canvas is the Learning Management System (LMS) at Boston College, designed to help faculty and students share ideas, collaborate on assignments, discuss course readings and materials, submit

assignments, and much more - all online. Your course will make significant use of Canvas this semester; you should familiarize yourself with this important tool. For more information and training resources for using Canvas, click [here](#).

In the case of any technical difficulties or concerns, please contact canvas@bc.edu or 617-552-HELP (4357) for immediate assistance. Canvas requires [particular computer specifications](#) and wifi access. It is important that you plan accordingly.

NOTE: If a face-to-face class session is canceled, please go to Canvas to learn how that session will be taught.

Course Outcomes

By the end of this course, students will be able to:

1. Analyze normal form and extensive form games.
2. Understand pure strategy and mixed strategy equilibrium.
3. Solve for equilibrium using backward induction.
4. Understand standard games like Cournot and Bertrand.

Woods College Undergraduate Learning Outcomes

All courses throughout the program introduce or help students to master the necessary skills, knowledge, and experiences for the 21st century professional listed below:

1. Critical thinking and problem-solving
2. Quantitative reasoning
3. Communication and information literacy:
 - a. Information literacy
 - b. Written communication
 - c. Oral and digital communication
 - d. Collaborative communication and teamwork
1. Acting as *Men and Women for and with others*
2. Integrative learning
3. Engaging with diverse perspectives

Weekly Expectations

Each week you can expect to spend an average of 12-15 hours reading and watching learning materials in Canvas; participating in class discussions and working on assignments.

Assessments and Grading Policy

Weight	Assessments	Meets Outcome #	Due
10%	Discussion Boards Posts	LO 1, 2, 5	Week 1, 4
40%	Problem Set	LO 1, 2,3, 4, 5, 6	Weekly
25%	Midterm exam	Lo 1-3	Week 3
25%	Final Exam	LO 3-6	Week 6

Below you will find more details about each of these activities or assignments.

Discussion Board Posts

An interactive assignment where students interact with other students through canvas. Additional details will be given on the Canvas website.

Problem Sets

Weekly assignments based on the material covered that week. Problem sets contain questions that you will solve based on your understanding of the material covered. You can refer your notes and the text to solve these. Additional details will be given on the Canvas website.

Midterm Exam/Final Exam

Exams based on the material covered up until the week of the exam. Additional details will be given on the Canvas website.

Rubrics

You will find all activity or assignment rubrics in Canvas.

Grading

The course will be graded out of 100 points. **A** = 94-100; **A-** = 90-93; **B+** = 87-89; **B** = 84-86; **B-** = 80-83; **C+** = 77-79; **C** = 73-76; **C-** = 70-72; **D+** = 67-69; **D** = 63-66; **D-** = 60-62; **F** = 59 and below

All students can access final grades through Agora after the grading deadline each semester. Students who complete course evaluations can access grades earlier, as they are posted.

Course Assignments

It is expected that you will spend 8 hours per week on out-of-class assignments and exercises. These are listed below. Please note that some weeks will require more time and some weeks less time but the average is approximately 8 hours per week over the semester.

Course Schedule

Week Date Title or Topic	Weekly Topics and Outcomes By the end of this week, you will be able to:	Readings and Learning Resources	Assessments and Activities
Week 1 Introduction	1. Identify the different components of a game. 2. Write down a payoff matrix corresponding to a given game. 3. Differentiate between Extensive form games and Normal form games	• Joel Watson-Ch 1, 2, 3 • Additional required resources in Canvas	• Discussion Board Post • Problem Set 1
Week 2 Nash Equilibrium	1. Identify dominant strategies and best response. 2. Solve for Nash Equilibrium for Normal Form Games 3. Solve for pure strategy and mixed strategy equilibrium.	• Joel Watson-Ch 4,6,7, 9,11 • Additional required resources in Canvas	• Problem Set 2
Week 3 Continuous Strategy Games	1. Write down a Cournot Duopoly model and Bertrand Nash 2. Solve the nash equilibrium outcomes for the Cournot duopoly game	• Joel Watson-Ch 10 • Additional required resources in Canvas	• Problem Set 3 • Midterm Exam
Week 4 Backward Induction and Subgame Perfection	1. Analyze extensive form games. 2. Solve for the equilibrium outcomes using backward induction. 3. Understand sub game perfection of a Stackleberg Duopoly	• Joel Watson Ch-15 • Additional required resources in Canvas	• Discussion Board Post • Problem Set 4
Week 5 Application	1. Learn about Bargaining games like ultimatum games and alternating offer games. 2. Solve for the equilibrium outcome.	• Joel Watson Ch-19, 20, 21 • Additional required resources in Canvas	• Problem Set 5
Week 6 Repeated Games	1. Learn about finitely and infinitely repeated games. 2. Solve for its subgame perfect equilibria.	• Joel Watson Ch-22 • Additional required resources in Canvas	• Problem Set 6 • Final Exam

Participation

Participating in class is an important component of learning. Students are expected to participate and complete all discussions, assignments, and assessments. While this is an asynchronous course, participating in online class discussion boards is an important component of learning. These discussion boards will take the place of our in-class interactions and should be used as both a space to provide opinions and thoughts, while also posing questions or asking for clarification on theories and concepts.

Consistent with BC's commitment to creating a learning environment that is respectful of persons of differing backgrounds, we believe that every reasonable effort should be made to allow members of the university community to observe their religious holidays without jeopardizing their academic status. Students are responsible for reviewing course syllabi as soon as possible, and for communicating with the instructor promptly regarding any possible conflicts with observed religious holidays. Students are responsible for completing all class requirements for days missed due to conflicts with religious holidays.

Submitting Problem Sets

All writing assignments are to be submitted through Canvas no later than 11:59 PM on the paper due date. Please submit all documents in either .doc or .docx format.

Late Work Submission Policies

Students must complete an initial discussion board post on Friday by 11:59 PM for the week they are due. If a student fails to submit an initial discussion board post they will receive a zero for that week's discussion board, regardless of if they post responses to classmates.

The deadlines for problem set submission can be found on canvas. Assignments submitted after the due date will lose a letter grade per day. For example, a paper submitted within 24 hours past the deadline is worth, at best, a B. This will continue for three days. After three days the paper will no longer be accepted. In the event of illness, emergency, other extenuating circumstances, or school-sanctioned events, please contact me as soon as possible, providing written verification of the excused absence. Makeup/late papers must be completed no later than 5 days after the original assignment due date. There are no exceptions to this policy.

Communication

You may contact me by email and I will respond within 24 hours.

Boston College Policies**Scholarship and Academic Integrity**

Students in Woods College courses must produce original work and cite references appropriately. Failure to cite references is plagiarism. Academic dishonesty includes, but is not necessarily limited to, plagiarism, fabrication, facilitating academic dishonesty, cheating on exams or assignments, or submitting the same material or substantially similar material to meet the requirements of more than one course without seeking permission of all instructors concerned. Scholastic misconduct may also involve, but is not necessarily limited to, acts that violate the rights of other students, such

as depriving another student of course materials or interfering with another student's work. Please see the [Boston College policy on academic integrity](#) for more information.

Accommodations and Accessibility

Boston College is committed to providing accommodations to students, faculty, staff, and visitors with disabilities. Specific documentation from the appropriate office is required for students seeking accommodation in Woods College courses. Advanced notice and formal registration with the appropriate office are required to facilitate this process. There are two separate offices at BC that coordinate services for students with disabilities:

- [The Connors Family Learning Center \(CFLC\)](#) coordinates services for students with LD and ADHD.
- [The Disabilities Services Office \(DSO\)](#) coordinates services for all other disabilities.

Find out more about BC's commitment to accessibility at www.bc.edu/sites/accessibility.