

ECON 325-A: GAME THEORY

Spring 2025

Instructor:	Jason Ralston	Time:	TTh 11:30 AM - 12:50 PM
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Class Structure: I have tried to make class materials as accessible – and myself as accommodating – as possible. To that end, I will be digitizing and posting some notes from the class as PDFs online.

In general, classes will be divided between theory and practice. That is, some classes will be entirely theory oriented, and others will be entirely dedicated to using the theory in practice. Some classes will have a mix of theory and practice. Some classes will feature experiments for extra credit.

If you ever need help with any of the material presented in class, stop by during office hours or contact me to set up an online meeting that works for you.

Office Hours: Fridays from 10:00 AM - 12:00 PM, 2:00 PM - 3:00 PM in Maxey 223 or by appointment.

Textbooks: The recommended textbook for this class is Giacomo Bonanno's, "Game Theory". This book is provided as a PDF on Dr. Bonanno's website (http://faculty.econ.ucdavis.edu/faculty/bonanno/GT_Book.html).

Along with the PDF, you can also find video lectures on Youtube as well as a link to buy a physical copy of the book, should you need/want it.

At times the class may slightly deviate from material presented in the textbook. Any written material introduced in class, but absent from the book, will be distributed through Canvas.

Objectives: This class is meant to serve as an introduction to game theory and explore some of the many areas it has been applied to. This is one of the first classes in which we will see economic agents acting strategically and considering not only their own strategy, but the strategies of all other players who are playing the game with them. After exploring the features of games, we will present a way to analyze different games and predict equilibrium play. This will involve the important concept of **Nash-Equilibrium** and some of its important refinements.

Of all the skills introduced in this class, the one that we will emphasize the most is *logical thinking*. While the math may involve some derivatives from an introductory calculus class, the far more important skill is logical reasoning and the ability to view the world from another person's perspective. By the end of the course you should walk away with a greater understanding of strategic interaction.

Tentative Course Outline:

Week	Day	Topic	Reading
1	Jan 21	Introduction to Game Theory	N/A
	Jan 23	The Language of Game Theory	Ch. 2.1
2	Jan 28	Strict and Weak Dominance	Ch. 2.2
	Jan 30	Iterated Deletion of Dominated Strategies	Ch. 2.5
3	Feb 4	Nash Equilibrium	Ch. 2.6
	Feb 6	Second Price Auctions	Ch. 2.3
4	Feb 11	Games with Infinite Strategy Sets	Ch. 2.7
	Feb 13	Sequential Games & Backward Induction	Ch. 3.1 - 3.2
5	Feb 18	Strategies in Sequential Games	Ch. 3.3
	Feb 20	POWER & PRIVILEGE - NO CLASS	N/A
6	Feb 25	Strategies, Subgames, and SPNE	Ch. 4.2 - 4.4
	Feb 27	MIDTERM #1	N/A
7	Mar 4	Games with Chance	Ch. 4.5
	Mar 6	Expected Utility	Ch. 5.1
8	Mar 11	Strategic for games with cardinal payoffs	Ch. 6.1
	Mar 13	Mixed Strategy Nash Equilibrium	Ch. 6.2 - 6.3
	Mar 17 - 28	SPRING BREAK - NO CLASS	N/A
9	Apr 1	Rationalizability	Ch. 6.4
	Apr 3	Behavioral Strategies in Sequential Form Games	Ch. 7.1
10	Apr 8	Problems with SPNE	Ch. 7.2 - 7.3
	Apr 10	Knowledge (Day 1)	Ch. 8.1
11	Apr 15	UNDERGRAD CONFERENCE - NO CLASS	N/A
	Apr 17	Knowledge (Day 2)	Ch. 8.2 - 8.3

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12	Apr 22	Beliefs (Day 1)	Ch. 9.1 - 9.2
	Apr 24	MIDTERM #2	N/A
13	Apr 29	Beliefs & Belief Updating	Ch. 9.3 - 9.4
	May 1	Screening Games	Handouts
14	May 6	Signaling Games	Handouts
	May 8	Information Cascades	Handouts
	May 16	FINAL	N/A

Grading Policy:

- Participation (10%)
- Homework (30%)
- Midterms (30%)
- Final Exam (20%)
- Final Project (10%)

Grading Scale:

A		B			C			D	F
A	A-	B+	B	B-	C+	C	C-	D	F
100% - 94%	93.9% - 90%	89.9% - 87%	86.9% - 84%	83.9% - 80%	79.9% - 77%	76.9% - 74%	73.9% - 70%	69.9% - 60%	Less than 60%

Once grading is completely finished, grades may be adjusted according to a curve. Do not ask for regrades or grade changes. Unless there is a grading error, grades will remain unchanged.

Participation: Regular attendance and participation in class discussions (both in-class and online) will contribute to this portion of your grade. There will also be a few “pop-quizzes” administered through Canvas during the course of the semester.

Homework Assignments: There will typically be weekly homework assignments. Homework will be collected online via Canvas and is due at the beginning of class. The lowest homework score will be dropped for each student.

Late Homework: Late homework can be submitted. However, for each 12 hours that the assignment is late, the grade will drop by 10 percentage points. For example, if an assignment were turned in 10 hours late and it would have received an 85% if had been turned in on time, it would instead receive a 75%.

Exams: A substantial portion of your grade will be based on two midterms and a final. *I do not give makeup exams except in the case of verified, unexpected emergencies.* If such an event occurs, verification will need to be submitted as soon as possible by both the student and the Dean of Students. You will be allowed to bring one page of handwritten notes to the exam.

Exams will largely consist of free-response questions. Often questions will require you to make an economic argument, find interesting equilibria in a game, or constructing a game to fit a particular situation. Generally there will be no multiple choice questions, as checking steps in your reasoning will be crucial for success.

Final Project: There will be a final project in which you will apply the tools we will study in this class to some example in the real world or some novel game that you construct. With a partner, you will come up with an environment in the real world that you believe is well modeled using concepts from game theory or a novel game that you believe would be interesting to study using game theory. You will describe the environment fully, construct a stylized version of the environment so that it looks like an example from class, and apply equilibrium concepts to predict how actors in the game would be expected to behave.

You have several formats that you can pursue for your final project: a paper, a video, or a podcast. There will be no final presentation of the project. However, no matter what format you decide to pursue, the same material should be presented in every project. The material and outline for the project will be covered in class using a rubric.

Questions and Comments: As you progress in this course, you will undoubtedly find yourself with questions or comments about the material we discuss. Whenever you have a question answered in a future class, or have a topic you believe would be well suited for a future class, please send me an email.

Extra Credit: Throughout the semester you *may* be given the opportunity to earn extra credit. The nature of the extra credit and its point value will be discussed on a case-by-case basis.

Important Due Dates:

Midterm #1	February 27 th
Midterm #2	April 24 th
Final Project	May 8 th
Final Exam	May 16 th

Student Responsibilities:

How to Succeed:

1. Read chapters of the textbook that correspond to the lecture notes.
2. Start homework earlier rather than later.
3. If you are finding the material difficult, please seek help from either your classmates or me. The material in this class builds on itself, so getting lost early can be detrimental to understanding material later on.
4. Feel free to work on assignments together. Not only will it help with your understanding, but you will form bonds with classmates that will be extremely valuable as you continue on at Whitman.
5. When reading about studies in the news, use the topics covered in this course to make sense of their estimates and how believable they are.

Accommodation: If you require an accommodation, please contact me, either in person or through the Academic Resource Center (503) 527-5213. I am here to help in any way I can.

Excused Absence: The Dean of Students may authorize absences from classes in cases of exigency (injury, illness, or family emergencies). In the event that such a verifiable emergency requires you to miss a scheduled exam, I expect you to contact me directly, as soon as possible.

AI Policy: The emergence of generative AI tools (such as ChatGPT and DALL-E) has sparked interest among many students in economics. The use of these tools for brainstorming ideas, exploring possible

responses to questions or problems, and as an additional source of explanation for the materials may be useful for you as you craft responses to class assignments. While there is no substitute for working directly with your instructor, the potential for generative AI tools to provide automatic feedback, assistive technology and language assistance is clearly developing. Please feel free to reach out to me well in advance of the due date of assignments for to check with me on acceptable uses of generative AI for particular assignments and I would be happy to discuss what is acceptable.

Also note that tests will be done in person, and reliance on AI assistance will not be afforded to you on exams. Since exams very closely resemble what you would solve in homework, it is very important that your homework solutions be from your own understanding. Otherwise, you risk receiving poor grades on tests and in the class.

Mental Health: Students (and people in general) struggle with mental health, even without academic considerations. If you have trouble with a course or are anxious about anything in general, please feel free to contact me. I am here to help!

Academic Integrity: Cheating and plagiarizing are **NOT** tolerated in my class. Cheating will result in a failing grade for that assignment and violations will be reported to the Dean of Students. The maximum penalty for academic dishonesty at Whitman College is permanent expulsion.

As stated above, you are encouraged to work together on homework assignments. However, I should be able to tell your work apart from that of another. If any work looks too similar, both assignments will receive a penalty.

Working together on a test is strictly prohibited unless otherwise stated. Evidence of collaboration will result in a zero for that test.