Stony Brook University

AMS 335/ECO 355: Game Theory
Economics Department
Last Updated 5/26/2025

Course Information
Course Title: Game Theory
Course Designator: AMS 335/ECO 355
Credits: 3 credits
Prerequisites: MAT 126 or 131 or 141 or AMS 151; C or higher in ECO 303
Semester, Year: Summer 2025
Mode of Instruction: Asynchronous Online
Time Zone: Eastern Daylight Time (EDT)

Instructor Information
Instructor Name: Siyuan Lyu

Instructor Email: siyuan.lyu@stonybrook.edu

Office Hours: Thursday 6:00 PM – 9:00 PM EDT (New York time) via Zoom.

Office Hours Appointment: Every week I will send a reminder with the link of Calendly, so that you could pick a 30-minute slot as you wish and fill in necessary information for a reservation. The link of Zoom meeting will also be included.

Course Description
Game theory is the study of strategic interaction between several decision-makers. We study the main equilibrium concepts for non-cooperative games in both static and dynamic settings with complete information: iterated strict dominance, rationalizability, Nash equilibrium, backward induction, and subgame perfection. We discuss applications to repeated games and multi-stage games drawing examples from politics, market competition, advertising, finance, labor markets, parlor games, and sports.

Learning Objectives
By the end of the semester, students will be able to:

LO1 Describe real-life scenarios as games. Including the actions available to each individual and the payoffs derived from these actions.

LO2 Develop critical thinking in terms of incentives: analyze the incentives of each individual to choose particular actions, taking into account what the opponents might do.

LO3 Solve games with the solution concept that better fits the game's description.

LO4 Evaluate the outcomes of games and their desirability.

LO5 Postulate possible alternatives to obtain more socially desirable outcomes.

LO6 Analyze both simultaneous and sequential games.

Course Delivery Mode and Structure

This is an asynchronous, online course *delivered in D2L Brightspace LMS*. To launch Brightspace you can click the following link here. Once on the homepage, you should see all your courses (alternatively, you can click on Course Home). Within a course, the visual table of contents (TOC) will showcase the modules of the course. You can also see the Calendar of the course, which will show you important deadlines and dates on which materials become available. As usual, the upper bar allows you to navigate through the contents, assignments, and discussions. Students must be mindful of all course expectations, deliverables, and due dates. Note that all times and deadlines will be on **New York time, which is Eastern Daylight Time (EDT)**.

Course Materials

The course will follow the textbook closely. Slides will be provided for each Module complementing the book chapters. As the entire book is uploaded on Brightspace, I suggest you first try to use the slides as the main course material and, if needed, the book to complement those. The slides and problem sets will be enough to get a good grade.

Recommended Textbook. Game Theory: An Introduction by Steven Tadelis, Princeton University Press, 2013

A partial solution manual is available here:
https://assets.press.princeton.edu/chapters/sm10001.pdf

How to Communicate and Interact in this Online Course

The preferred method of contact is via email. Please be sure to include **your full name** and **"GT Summer 2025"** in the **subject line** when you send an email. I will respond to your emails as soon as possible, but please allow me 24-48 hours for a response.

Assessments

Your grade in this class will be based on your performance in problem sets (25%), two exams (30% each), and participation in the discussion board (15%).

Assessment/Assignment/Exam	Percentage
Discussion Boards	15%
Problem Sets	25%
First Exam (June 15th)	30%
Second Exam (July 3rd)	30%
Total	**100%**

Discussion Boards. (15%) There will be 5 discussion boards (1 for each module). Students will have to participate in the Module's discussion board by creating their own posts on the topic at hand *and* by commenting on classmates' posts.

1. At the beginning of the course, you will be asked to introduce yourself. (Graded)
2. In each module there will be a discussion question to which you will need to respond. It will be related to the topic of the Module. Moreover, you will be required to respond to **at least one** of your peers' responses. Polite, constructive, and well-argued comments are the only responses accepted. No responses or short responses such as "I agree" or "You are right" will not be graded. (Graded)
3. There will also be a general questions forum where you can post any query related to the course. This will help other fellow students who might have the same question. (Not graded)

Problem Sets. (25%) There will be 5 problem sets (1 for each module). Homework will be assessed coarsely. Effort level and accuracy are both valued. *Late submissions will NOT be accepted unless reasonable explanations are provided. Copy-pasted answers will also not be accepted.* Detailed solutions of the Problem Sets will be uploaded to Brightspace after the deadline of each problem set.

Exams. (60%) There will be *two take-home exams*. The first one will take place June 15th and will cover the materials from Modules 1-3. The second exam will take place on July 3rd and will cover materials from Modules 4-5. The exams are take-home exams. The exam will be open for 12 hours, and you could pick any time to start for your convenience. However, once the exam is open, you will have 100 minutes to finish it with no intervals.

Problem sets and exams will be posted on Brightspace, and you should upload your solutions as a PDF file on Brightspace (you can use a free app like Genius Scan or CamScanner to scan your handwritten answers with your phone, or type up your answers). *Late submissions will NOT be accepted.* **There will be no makeup exams.** *Any suspicions of cheating will be taken extremely seriously and reported to the Academic Judiciary for possible dishonesty. You will be recommended to get at least an F in the course.* See the section on Academic Integrity.

Caution. The deadlines for the tasks within each module are *strictly enforced*. All assignments are due at 11:59 PM EDT on their respective due date. To avoid last-minute technical problems, it is recommended that you complete the requirements of the module with some time to spare.

Course Schedule
The possibility exists that unforeseen events will make schedule changes necessary. Any changes will be clearly noted in Brightspace Announcements or through Stony Brook email.

The course is composed of 5 different Modules and there will be two exams. In each Module, you are supposed to finish the learning materials and complete the assignment and the discussion topic within the duration of the module. Each Module will be available *1 day* before the start date. The deadline for each task in the module is 11:59 pm EDT on the end date.

Dates		Week	Module	Topic	Book Chapters
Start	End				
May 27th	June 1st	1	Module 1	Introduction & Rational Behaviors	Ch. 3-4
June 2nd	June 8th	2	Module 2	Nash Equilibrium	Ch. 5
June 9th	June 14th	3	Module 3	Mixed Strategies	Ch. 6
June 15th	June 15th	3		**First Exam**	
June 16th	June 22nd	4	Module 4	Dynamic Games	Ch. 7-8
June 23rd	July 30th	5	Module 5	Multi-stage & Repeated Games	Ch. 9-10
July 3rd	July 3rd	6		**Second Exam**	
July 5th	July 5th	6		**Last day of Summer Semester**	

There will be 2 review sections, 1 before each exam. I will upload a video going over the key points and a sample exam for your preparation. You could expect the materials three days prior to the exam.

Note that Modules can have different lengths. It is your responsibility to be aware of this. Moreover, you should check the page of the course on Brightspace, at least, at the beginning of the module *AND* a day before the end of the Module. For each Module, you need to:

- Read and understand the slides. If needed, complement those with the book chapter(s) assigned to the Module.
- Join the discussion forum.
- Complete the Module's problem set.
- If you have any doubts, attend office hours and/or send me an email with your doubts!

Course Topics

1. Introduction: What is game theory? Elements of a game and static games with complete information. Classic examples of games. Solution concepts.
2. Rational Behavior: Dominance, dominated strategies, and iterated elimination. Best responses and rationalizability.
3. Nash equilibrium: Pure and mixed strategies.
4. Dynamic games: Extensive-form games. Sequential rationality and subgame perfection.
5. Multi-stage and repeated games.

Student Success Resources: How to Be a Successful Student in This Course

There are multiple resources, university offices, and help desks that are available to assist you with everything from advising, tutoring, accessibility and much more.

Review some [Academic Success Strategies](#) and visit the [Student Resources](#) page for links to resources on campus.

Technical Requirements and Assistance

[D2L Brightspace](#) is Stony Brook University's digital learning environment. It is used for the facilitation of communications between faculty and students, submission of assignments, and secure posting of grades and feedback in your courses. To [access Brightspace](#), go to [mycourses.stonybrook.edu](#) and use your SBU NetID and password. If you are unsure of your NetID, visit [Finding Your NetID and Password](#) for more information.

Sometimes submitting coursework via a tablet and/or mobile device can be challenging. Computers equipped with the appropriate software are available for use at the various [SINC site computer labs](#). Both physical and virtual labs are available. You can also borrow a computer through [SBU's Laptop Loan Program](#).

Visit the [Technical Requirements page](#) for additional information regarding hardware and software options.

Please use the following information if you need technical assistance at any time during the course or to report a problem with Brightspace:
Brightspace Support via SUNY Helpdesk
- Phone: 1-844-673-6786
- Submit a [ticket or chat online](#)

Stony Brook University: Academic Technology Services
- Phone: 631-632-9800
- Email: [AcademicTechnologies@stonybrook.edu](#)

Privacy Policies

This course utilizes various educational technologies to enhance the learning experience. You can [access links to the privacy policies](#) of the tools and platforms used at Stony Brook University on the [Syllabus Addendum webpage](#).

University Policies

Student Accessibility Support Center Statement

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at [sasc@stonybrook.edu](#). They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at
- http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Understand When You May Drop This Course
If you need to drop or withdraw from the course, it is your responsibility to be aware of the tuition liability deadlines listed on the registrar's Academic Calendar. Before making the decision to drop/withdraw you may want to contact me or refer to the University's policies:
- Undergraduate Course Load and Course Withdrawal Policy

Incomplete Policy
Under emergency/special circumstances, students may petition for an incomplete grade. Circumstances must be documented and significant enough to merit an incomplete. If you need to request an incomplete for this course, contact me for approval as far in advance as possible. You should also read the University's policies that apply to you: Undergraduate Bulletin

Course Materials and Copyright Statement
Course material accessed from Brightspace, Zoom, Echo 360, VoiceThread, etc. is for the exclusive use of students who are currently enrolled in the course. Content from these systems cannot be reused or distributed without written permission of the instructor and/or the copyright holder. Duplication of materials protected by copyright, without permission of the copyright holder is a violation of the Federal copyright law, as well as a violation of Stony Brook's Academic Integrity.