

ECON 4930
Introduction to Game Theory
FALL 2025 SYLLABUS

CLASS INFORMATION

Time: TR 12:45pm–2:00pm
Location: Davis-Shaughnessy Hall 374
Office Hours: TR 2:00pm–3:00pm
Web: github.com/econdojo/game

INSTRUCTOR CONTACT

Instructor: Fei Tan
Office: Davis-Shaughnessy Hall 469A
Primary: discord.gg/SsrNPEeP2P
Secondary: tanf@slu.edu

GENERAL INFORMATION

COURSE DESCRIPTION

This course offers an introduction to game theory and its applications, building on the foundations developed in microeconomic principles. It will provide analytical tools and formal models to explain strategic interactions between rational decision-makers, including concepts of Nash equilibrium, dominant strategies, extensive form games, and Bayesian games. To optimize learning outcomes, this course incorporates artificial intelligence to enhance students' understanding of game-theoretic concepts. These AI tools provide personalized learning, real-time feedback, and practical application support. Finally, this course will help prepare students entering graduate education or starting careers in economics, political science, business strategy, or policy analysis.

PREREQUISITES

ECON 3140 (Intermediate Microeconomics). In general, students should be familiar with the concepts of optimization, utility maximization, profit maximization, and market equilibrium. Students are also expected to be familiar with functions, their graphical representation, basic calculus concepts, and the solution of simultaneous equations. Prior exposure to probability theory is helpful but not required.

TEXTBOOKS

- **Required:** *Game Theory 101: The Complete Textbook & International Relations*, by William Spaniel.
- **Optional:** *Game Theory: Analysis of Conflict*, by Roger Myerson.
- **Optional:** *Principles for Dealing with the Changing World Order: Why Nations Succeed and Fail*, by Ray Dalio.

CLASS ACTIVITIES

HOMEWORK

There will be four online assignments with a total of 40% or 200 points of the course grade. Please submit your completed work via Canvas.

PARTICIPATION

Class participation is strongly encouraged. Your properly documented class discussion will be rewarded with a maximum of 12% or 60 points of the course grade.

EXAMINATION

There will be two exams with a total of 48% or 240 points of the course grade. Students are responsible for all materials presented in the textbook, lecture notes, and supplementary materials (if assigned) as preparation for exams.

GRADING POLICY

GRADING SCALE

There is no grading curve used other than the scale below. However, the instructor reserves the right to adjust the grading scale based on overall class performance at the end of the semester. The final grade for the course is based on the percentage of the adjusted total points earned. **Please periodically check your grade throughout the semester for accuracy.**

	Max Points	% of Total	Grade	Points	Percentage
Homework	200	40	A	460–500	92–100
Participation	60	12	A-	440–460	88–92
Examination	<u>240</u>	<u>48</u>	B+	420–440	84–88
Total	500	100%	B	400–420	80–84
			B-	380–400	76–80
			C+	360–380	72–76
			C	340–360	68–72
			C-	320–340	64–68
			D	300–320	60–64
			F	0–300	0–60

MAKE-UP POLICY

Late submission is not graded and will be nullified. There are no make-up exams. The points from the excused, missed exam will be placed onto the next exam. No make-ups are provided for homework. The missed homework points, due to an approved absence, will be considered when calculating your final grade.

COURSE OUTLINE

Below is a tentative outline that is designed to achieve five learning objectives (LO). The instructor reserves the right to change it whenever needed. My goal is to proceed at an optimal pace: slow enough that important concepts are thoroughly learned, yet fast enough that the course does not drag. It is a delicate balance.

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Preliminary	
Getting Started with AI Agents	
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Part I	Introduction
	Lecture 1: Basic Strategic Form Games
	Lecture 2: Extensive Form Games
	Lecture 3: Advanced Strategic Form Games
	Lecture 4: Games with Infinite Strategy Spaces
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Part II	Advanced Topics
	Lecture 5: Expected Utility Theory
	Lecture 6: Repeated Games
	Lecture 7: Bayesian Nash Equilibrium
	Lecture 8: Perfect Bayesian Equilibrium
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MISCELLANEOUS INFORMATION

1. **Academic Integrity.** Academic integrity is the commitment to and demonstration of honest and moral behavior in an academic setting. Since the mission of the University is “the pursuit of truth for the greater glory of God and for the service of humanity,” acts of integrity are essential to its very reason for existence. Thus, the University regards academic integrity as a matter of serious importance. Academic integrity is the foundation of the academic assessment process, which in turn sustains the ability of the University to certify to the outside world the skills and attainments of its graduates. Adhering to the standards of academic integrity allows all members of the University to contribute to a just and

equitable learning environment that cultivates moral character and self-respect. The full University-level Academic Integrity Policy can be found on the Provost's Office website at: www.slu.edu/provost/policies/academic-and-course/academic-integrity-policy.pdf.

2. **Disability Accommodations.** Students with a documented disability who wish to request academic accommodations must formally register their disability with the University. Once successfully registered, students also must notify their course instructor that they wish to use their approved accommodations in the course.

Please contact the Center for Accessibility and Disability Resources (CADR) to schedule an appointment to discuss accommodation requests and eligibility requirements. Most students on the St. Louis campus will contact CADR, located in the Student Success Center and available by email at accessibility_disability@slu.edu or by phone at 314.977.3484. Once approved, information about a student's eligibility for academic accommodations will be shared with course instructors by email from CADR and within Banner. Students who do not have a documented disability but who think they may have one also are encouraged to contact CADR. Confidentiality will be observed in all inquiries.

3. **Title IX.** Saint Louis University and its faculty are committed to supporting our students and seeking an environment that is free of bias, discrimination, and harassment. If you have encountered any form of discrimination on the basis of sex, including sexual harassment, sexual assault, stalking, domestic or dating violence, we encourage you to report this to the University. If you speak with a faculty member about an incident that involves a Title IX matter, that faculty member must notify SLU's Title IX Coordinator that you shared an experience relating to Title IX. This is true even if you ask the faculty member not to disclose the incident. The Title IX Coordinator will then be available to assist you in understanding all of your options and in connecting you with all possible resources on and off campus.

If you are pregnant or experiencing a pregnancy related condition, the Title IX Coordinator can assist you in understanding your rights and options as well as provide supportive measures.

Anna Kratky is the Title IX Coordinator at Saint Louis University (DuBourg Hall, room 36; anna.kratky@slu.edu; 314-977-3886). If you wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK or make an anonymous report through SLU's Integrity Hotline by calling 1-877-525-5669 or online at SLU.EDU/INTEGRITYHOTLINE. To view SLU's policies, and for resources, please visit the following web addresses: www.slu.edu/about/safety/sexual-assault-resources/index.php.