

ECON 4930
Introduction to Game Theory
FALL 2025 SYLLABUS

CLASS INFORMATION

Time: TR 12:45pm–2:00pm

Location: Cook Hall 236

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. This set of tools is used to understand strategic behavior in international relations. 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 [GitHub Classroom](#).

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.

	Preliminary
	Getting Started with AI Agents

Part I	Game Theory
	Lecture 1: Basic Strategic Form Games
	Lecture 2: Extensive Form Games
	Lecture 3: Advanced Strategic Form Games
	Lecture 4: Games with Infinite Strategy Spaces
	Lecture 5: Expected Utility Theory
	Lecture 6: Repeated Games
	Lecture 7: Bayesian Nash Equilibrium
	Lecture 8: Perfect Bayesian Equilibrium

Part II	International Relations
	Lecture 9: Conflict versus Cooperation
	Lecture 10: Rationalist Explanations for War
	Lecture 11: International Trade
	Lecture 12: Principal-Agent Problems and Leader-Based Explanations

MISCELLANEOUS INFORMATION

Please read the following information thoroughly and carefully. I would assume that you have fully understood these rules.

1. In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. The Student Success Center, which assists students with academic and career related services, is located in the Busch Student Center (Suite 331) and the School of Nursing (Suite 114). Students who think they might benefit from these resources can find out more about: [i.] course-level support (e.g. faculty member, departmental resources) by asking your course instructor; and [ii.] university-level support (e.g., tutoring services, university writing services, disability services, academic coaching, career services, and/or facets of curriculum planning) by visiting the Student Success Center.
2. All students experience stressors and challenges at some point, and seeking support is beneficial. Such challenges may be the result of academic concerns (such as those related to particular assignments or content in a course), or they may be more personal in nature (such as concerns related to relationships, mental health, loss, identities, alcohol or drugs, housing or food security, or finances, among other things). For concerns related to this course, please contact me. I am invested in your success and will support your success in the ways I can. Additionally, you have access to the many resources SLU provides in support of your personal wellness. You will find a list of available resources on the [Well-being page of the SLU website](#).
3. 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 the instructor's official course roster. Students who do not have a documented disability but who think they may have one also are encouraged to contact to CADR. Confidentiality will be observed in all inquiries.
4. Academic integrity is honest, truthful and responsible conduct in all academic endeavors. The mission of Saint Louis University is "the pursuit of truth for the greater glory of God

and for the service of humanity.” Accordingly, all acts of falsehood demean and compromise the corporate endeavors of teaching, research, health care, and community service via which SLU embodies its mission. The University strives to prepare students for lives of personal and professional integrity, and therefore regards all breaches of academic integrity as matters of serious concern. Additionally, each SLU College, School, and Center has adopted its own academic integrity policies, available on their respective websites. It is the policy of Chaifetz School of Business that the “Giving and receiving of unauthorized assistance on any graded exercise constitutes academic dishonesty and may result in grade reductions and/or probation, suspension, or dismissal.” All SLU students are expected to know and abide by these policies, which detail definitions of violations, processes for reporting violations, sanctions, and appeals. Please direct questions about any facet of academic integrity to your faculty, the chair of the department of your academic program, or the Dean/Director of the College, School or Center in which your program is housed.

5. 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 sexual misconduct (e.g. sexual assault, sexual harassment, stalking, domestic or dating violence), we encourage you to report this to the University. If you speak with a faculty member about an incident of misconduct, that faculty member must notify SLU’s Title IX coordinator, Anna R. Kratky (DuBourg Hall, room 36; akratky@slu.edu; 314-977-3886) and share the basic fact of your experience with her. 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 wish to speak with a confidential source, you may contact the counselors at the University Counseling Center at 314-977-TALK.