BACHELOR OF ECONOMICS
THAMMASAT UNIVERSITY

Course Outline

EE415 GAME THEORY (Sec.046401)

Semester 2/2025

Class Time and Logistic

Class day: Wednesday
Class time: 13.00 – 16.00
Venue: Room 204
Teaching Materials Platform: Google classroom using code so25j7qk
https://classroom.google.com/c/ODM4MjIxNTk1MjUz?cjc=so25j7qk

Instructor:

Name: Asst. Prof. Dr. Pornthep Benyaapikul
Office Hours: Monday, 13.30 – 14.30 or By Appointment
Email: pornthep@econ.tu.ac.th

Course Description

The application of game theory under complete and incomplete information including strategic games, Nash Equilibrium; Mixed-Strategies Equilibrium; Extensive games; Subgame perfect equilibrium; Bayesian game; Extensive game of incomplete information; other applications of game theory.

Prerequisites: EE311 and EE320 (or EE421)

Course Objective:

1. To equip students with essential mathematical concepts and tools in studying economics
2. To expose students to the application of mathematical concepts in analysing economic problems.

Expected Learning Outcomes

CLOs	PLOs	Activities	Assessment
CLO1 Demonstrate a thorough understanding of key concepts in game theory, including Nash equilibrium, dominant strategies, and mixed strategies.	K1, S1, E1, C1, C4	- Lectures - Class Assignment	Midterm Exam 30% Final Exam 40% Class Assignment 30%
CLO2 Analyze strategic interactions in various economic, political, and social settings using formal game-theoretic models.	K2, S1, S2, E3, C2	- Lectures - Class Assignment	Midterm Exam 30% Final Exam 40% Class Assignment 30%
CLO3: Evaluate the implications of strategic behavior on policy design and economic outcomes.	K2, S2, E1, E3, C1, C2	- Lectures - Class Assignment	Midterm Exam 30% Final Exam 40% Class Assignment 30%
CLO4: Develop critical thinking skills by identifying assumptions, limitations, and alternative approaches within game-theoretic models.	K4, S2, E3, C4	- Lectures - Class Assignment	Midterm Exam 30% Final Exam 40% Class Assignment 30%

Learning Management and Evaluation

CLO	Learning Management	Evaluation
CLO1 (K1, S1, E1, C1, C4) Demonstrate a thorough understanding of key concepts in game theory, including Nash equilibrium, dominant strategies, and mixed strategies.	• Lecture with guided derivations (definitions and equilibrium concepts) • In-class worked examples and short problem-solving drills • Weekly practice problems / structured problem sets (progressive difficulty) • Independent study prompts (students identify what they need to review/learn next) • Short reflection checks to encourage active learning and continuous improvement	• Class assignments / problem sets (concept checks and solution quality) • Midterm exam (core concepts and standard problems) • Final exam (comprehensive, including mixed strategies and advanced equilibrium concepts)
CLO2 (K2, S1, S2, E3, C2) Analyze strategic interactions in various economic, political, and social settings using formal game-theoretic models.	• Modelling workshops (translate narratives to normal/extensive form) • Guided discussion of applications (e.g., entry, pricing, bargaining, voting) • Small-group board work / solution walk-throughs (students explain steps) • Structured discussion rules (listen, respect different viewpoints, critique ideas not people) • Homework emphasising model set-up, interpretation, and clear communication	• Class assignments (model formulation, equilibrium analysis, and interpretation) • Midterm exam (modelling, solving, and interpretation) • Final exam (applied questions; includes dynamic and/or incomplete-information contexts)

CLO3 (K2, S2, E1, E3, C1, C2) Evaluate the implications of strategic behavior on policy design and economic outcomes.	• Lecture linking models to policy questions (commitment, institutions, and incentives) • Case-based discussion (how outcomes change under alternative rules) • Short applied write-ups: model → equilibrium → welfare/policy implications • Peer feedback sessions (students provide constructive comments and revisions) • Emphasis on academic integrity and responsible reasoning in policy recommendations	• Class assignments (applied write-ups / policy-implication tasks) • Midterm exam (interpretation and implications for simpler models) • Final exam (policy/welfare implications in repeated and incomplete-information settings)
CLO4 (K4, S2, E3, C4) Develop critical thinking skills by identifying assumptions, limitations, and alternative approaches within game-theoretic models.	• "Assumptions audit" activities (what drives the result?) • Compare solution concepts (NE vs. SPNE vs. PBE) using the same scenario • Reflection prompts embedded in assignments (limitations, robustness, alternative modelling choices) • Independent extension tasks (students explore a new application or extension to deepen understanding) • Peer review of solution write-ups (clarity, logic, and respectful critique)	• Class assignments (quality of reasoning, clarity, robustness, and reflection components) • Midterm exam (identify assumptions/structure and select suitable solution concept) • Final exam (critical evaluation across game forms; includes signalling/PBE contexts)

Learning Assessment Plan

CLO	Methods of Learning Assessment	Assessment Week	Proportion of Assessment
CLO1	• Class assignments / problem sets • Midterm exam • Final exam	• Weeks 1–15 (ongoing) • Week 7 (Feb 25) • After Week 15 (May 18)	• 25% • 35% • 40%
CLO2	• Class assignments / modelling exercises • Midterm exam • Final exam	• Weeks 1–15 (ongoing) • Week 7 (Feb 25) • After Week 15 (May 18)	• 25% • 35% • 40%
CLO3	• Class assignments / applied write-ups (policy implications) • Midterm exam • Final exam	• Weeks 1–15 (ongoing) • Week 7 (Feb 25) • After Week 15 (May 18)	• 25% • 35% • 40%
CLO4	• Class assignments / critical reasoning components • Midterm exam • Final exam	• Weeks 1–15 (ongoing) • Week 7 (Feb 25) • After Week 15 (May 18)	• 25% • 35% • 40%

Evaluation

Midterm Exam	35 %
Final Exam	40 %
Class Assignment	25 %

Main Text

1. Avinash Dixit, Susan Skeath and David McAdams. (2021) Games of Strategy, 5th edition, W.W. Norton & Company. (ASD)
2. Joel Watson (2013) Strategy: An Introduction to Game Theory, 3rd edition, W.W. Norton & Company. (W)
3. Joseph Harrington Jr. (2014) Games, Strategies and Decision Making. Worth Publishers. (Second edition). (H)

Other Recommend Text

1. Prajit K. Dutta (1999) Strategis and Games : Theory and Practice, 1st edition, MIT Press (PD)

Week	Date	Course Content	Reading References	
1	Jan 7	Structure of the Game	ASM Ch 1-2, W Ch 2-3	
2	Jan 14	Simultaneous Move Game	ASM Ch 1-2, W Ch 2-3	
3	Jan 21	Sequential Move Game	ASM Ch 3, W Ch 2-3	
4	Jan 28	Nash Equilibrium		
5	Feb 4	Mixed Strategy	ASM Ch7	
6	Feb 11	Subgame and Subgame Perfection	ASM Ch 6	
7	Feb 18	Subgame and Subgame Perfection: Application		
	Feb 25	Midterm Exam	Time: 12.00-14.00	Venue: Faculty of Economics, Thammasat University
8	Mar 4	Repeated Game	ASM Ch9	

Week	Date	Course Content	Reading References	
9	Mar 11	Games with Incomplete Information and Bayes-Nash Equilibrium	W Ch.28	
10	Mar 18	Games with Incomplete Information and Bayes-Nash Equilibrium: Application		
11	Mar 25	Perfect Bayesian Equilibrium	W Ch 29	
12	Apr 1	Perfect Bayesian Equilibrium	W Ch 29	
13	Apr 8	Signaling Games and The Lemons Problem		
	Apr 15	Songkran Holiday: No Class		
14	Apr 22	Perfect Bayesian Equilibrium: Other Application		
15	Apr 29	Review Session		
	May 18	Final Exam	Time 9.00-12.00	Venue Faculty of Economics, Thammasat University