National Cheng Kung University
Modular Course 2025 Summer Program

Academic Year : 114, Semester : 1 Category : Natural and Engineering Sciences

賽局理論導論
Introduction to game theory

Instructor	Affiliation	Graduation (Ph.d.)
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Category	Course Credit	Student Size (Maximum)
Natural and Engineering Sciences	**1**	**25**

Student Background

College of Science, College of Engineering, College of Bioscience and Biotechnology, College of Electrical Engineering and Computer Science, College of Medicine, College of Management

Difficulty

☐ **Challenging** ☐ **Moderately Difficult** ■ **Medium** ☐ **Entry Level (Basic)**

Format of The Course

Lecture 50%，Implementation 50%

Grading Policy

In class exam 90 %：in the last class 16:40-17:40

Participation 10%

Code of Conduct for The Course

None

Course Description

   Game theory is a mathematical model in which decision-making involves several participants who interact with each other. In addition, it attempts to derive rational decision-making behaviors from social conflict-situations. Game theory is originally a branch of mathematics; however, it finds many applications in many fields and disciplines.

Keywords：Zero sum game, mixed strategies, Nash equilibrium

Timetable and Syllabus

Period	Timetable	Syllabus
2025/8/11(MON)	**14:00-17:40**	**preliminaries and introduction**
2025/8/12(TUE)	**14:00-17:40**	**one round zero sum games with two players and their value**
2025/8/13(WED)	**14:00-17:40**	**mixed strategies in one round zero sum game with two players**
2025/8/14(THU)	**14:00-17:40**	**one round non-zero sum games with multiple players**
2025/8/15(FRI)	**14:00-16:40**	**dynamic games with multiple rounds**
	16:40-17:40	**Exam**

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Goal of the Course

1. **Ability to model a simple game situation with mathematical objects**
2. **Ability to analyze different game situations in the mathematical setting.**
3. **Ability to solve simple games with mathematical tools.**

The Importance, Cross-Over Disciplinary and Contemporary of The Curriculum

In recent years, the concept of game theory has often appeared in the popular media. Thiscourse is aimed to bring interested students into the field to learn how mathematical tools canbe applied in the decision-making process.

Remarks

References：

Myerson, Roger B. : Game theory: Analysis of Conflict. Harvard University Press(1991)

Lecture notes of the instructor.

本課程若因天災等不可抗力之因素或中央、地方政府公告停課，授課教師需依情況依建議補課方式調整課程進度與補課；若需使用假日、國定假日補課，則需與所有修課學生達成共識方能用例假日補課。

建議補課方式：

1. 線上授課方式補課；
2. 當預期可能會因天災(颱風、超大豪雨…等)宣佈停課時，建議老師先行調整加快課程進度或預先增加可能天氣預警之前幾次課程時數；
3. 停課後隔天起延後下課，補足停課延誤的進度；若停課超過 1 天，則在開始上課後延後下課補課，或當週星期六、日補課；

更改課程授課方式，例如：DEMO 改以考試、報告、作業取代。