

Academic Org: Div of Computer Science & Engg – Subject: Computer Science

Course: CSCI5350	Course ID: 002638	Eff Date: 2024-07-01	Crse Status: Active	Apprv. Status: Approved	[New Course]
Advanced Topics in Game Theory 博弈論高級專題					

This course covers fundamental concepts in game theory. The course starts with pure strategy and mixed strategy Nash equilibrium in strategic games. It then discusses some specific types of games, including zero-sum games, Bayesian games, and introduces other types of equilibriums including correlated equilibrium and evolutionary equilibrium. Extensive games, subgame perfect equilibrium, sequential equilibrium, framing effects, behavioural strategies will then be discussed. Finally, coalitional games and the core will be discussed.

Advisory: Students are expected to have taken CSCI2110 or ENGG2440 or ESTR2004, ENGG2040 or ENGG2430 or ESTR2002.

本科講授博弈論的基本概念。首先討論策略博弈中的純策略和混合策略納什均衡。隨之介紹一些特別博弈，如零和博弈、貝葉斯博弈，和其他種類的均衡，包括相關均衡和演化均衡。隨之講授擴展博弈、子博弈精煉均衡、貫序均衡、設計效應、行為策略。最後討論聯盟博弈和核心。

建議：學生應曾修讀CSCI2110或 ENGG2440或 ESTR2004, ENGG2040或ENGG2430或ESTR2002。

Grade Descriptor: A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:

Units: 3 (Min) / 3 (Max) / 3 (Acad Progress)

Grading Basis: Graded

Repeat for Credit: N

Multiple Enroll: N

Course Attributes: MSc Computer Science
MPhil-PhD Computer Sci & Erg

Topics:

COURSE OUTCOMES

Learning Outcomes:

- At the end of the course of studies, students will have acquired the ability to
1. understand pure strategy and mixed strategy Nash equilibrium in strategic games;
 2. understand zero-sum games, Bayesian games, correlated equilibrium and evolutionary equilibrium;
 3. understand extensive games, subgame perfect equilibrium;
 4. understand sequential equilibrium, framing effects, behavioural strategies, perfect Bayesian equilibrium and trembling hand perfect equilibrium.
 5. understand coalitional games and the core.

Course Syllabus:

This course covers fundamental concepts in game theory. The course starts with pure strategy and mixed strategy Nash equilibrium in strategic games. It then discusses some specific types of games, including zero-sum games, Bayesian games, and introduces other types of equilibriums including correlated equilibrium and evolutionary equilibrium. Extensive games, subgame perfect equilibrium, sequential equilibrium, framing effects, behavioural strategies will then be discussed. Finally, coalitional games and the core will be discussed.

Assessment Type:

- | | |
|--------------------|-------|
| Essay test or exam | : 55% |
| Others | : 45% |

Feedback for Evaluation:

1. Examinations
2. Course evaluation and questionnaire
3. Reflection of teachers
4. Question-and-answer sessions during class
5. Student consultation during office hours or online

Required Readings:

To be provided by course teacher.

Recommended Readings:

1. Osborne and Rubinstein, A Course in Game Theory. The MIT Press, 1994.
2. Osborne, An Introduction to Game Theory. Oxford University Press, 2003.

OFFERINGS

1. CSCI5350 Acad Organization=CSEGV; Acad Career=RPG

COMPONENTS

DIS : Size=30; Final Exam=N; Contact=1
LEC : Size=30; Final Exam=Y; Contact=3

ENROLMENT REQUIREMENTS

1. CSCI5350 **Enrollment Requirement Group:**
For students in MSc Computer Science or MPhil-PhD Computer Science & Engineering or UG Computer Science or UG
Computer Engineering;
Exclusion: CMSC5728

Additional Information

VTL-Onsite face-to-face hrs 0
VTL-Online synch. hrs 0
VTL-Online asynch. hrs 0

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