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.

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.

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.

C

有關等級說明的資料，請參閱英文版本。
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.

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.

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.

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:

<table>
<thead>
<tr>
<th>Assessment Type</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Essay test or exam</td>
<td>55%</td>
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<tr>
<td>Others</td>
<td>45%</td>
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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:
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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