

00420183
GAME THEORY
Spring 2021

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Course Description: This course will follow Prof. Thomas Ferguson's MATH 167 Game Theory course at UCLA. A few more topics will also be added. We recommend the electronic text by Thomas Ferguson as our basic reference. Topics to be covered: 2-person 0-sum games, Minimax Theorem, games in extensive form, bimatrix games and n-person games, Nash equilibrium, correlated equilibrium, evolutionarily stable equilibrium, repeated prisoner's dilemma, 2-person game with transferrable utility, Nash Bargaining Problems, games in coalition form, 2-sided matching problems, games with incomplete information (if time permitted).

Prerequisites: Advanced Calculus and Linear Algebra

Learning Outcomes:

- Be able to describe the core ideas and concepts of Game Theory
 - Be able to solve problems in level of difficulties similar to homework assignments
 - Be able to recognize the power of abstraction and generalization
 - Be able to apply rigorous, analytic, highly numerate approach to analyze and solve problems.
 - Be able to communicate problem solutions using correct mathematical terminology
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- After each lecture, the ppt will be uploaded at 网络学堂
 - Assignments will be posted and to be submitted at 网络学堂
 - I will also upload some interesting reading materials at 网络学堂. They are intended for enrichment and will not appear at examination

Assessment (subject to changes due to pandemic situation):

*Attendance (5%)

*Assignment (35%): Homework assignments will be assigned at 网络学堂. Students have to submit their solutions at 网络学堂 on time. As it takes time to type the solutions, students are encouraged to do their assignments on papers and then upload the scanned

copy at 网络学堂。 However, the solutions should be neatly and orderly written to receive grades.

*Project (15%): Due 5 June 2021. Details about the project will be announced around the 12th week.

*Examination (45%)

Grading Policy: Course grade G :

$G = \text{Attendance} + \text{Assignment} + \text{Project} + \text{Examination} + \delta$, where

δ : Mission δ grade, $0 \leq \delta \leq 5$, is the grade for doing assigned challenging problems.

FAIL: $0 \leq G < 60$, PASS: $60 \leq G < 85$, EXCELLENT: $85 \leq G$