

GAME THEORY (WMH02401)

Spring 2023

Instructor:	Johann Caro-Burnett	email:	johannecb[at]hiroshima-u.ac.jp
Dates:	Tuesdays, from 04/11 to 05/30	Time:	08:45-10:15 & 10:30-12:00
TA:	Bai Bing	Location:	IDEC-203.

Objectives: The goal of this course is to provide an introduction to game theory. The course is designed for graduate students and advanced undergraduate students with a solid mathematical background. We will formally define games and equilibrium concepts, and we will also study examples.

Prerequisites: There are no prerequisites to this course, however it is strongly suggested to have a solid background in mathematics.

Textbook: Please use your notes and the slides provided. There is no textbook, but I like:

Osborne, M.J. and A. Rubinstein (1994). *A Course in Game Theory*. MIT Press. URL: <https://arielrubinstein.org/gt/arielDocs/>.

The textbook is free to download. The notation of the book may be different from the notation I use.

Grading: Grading will be based on:

- 20% Weekly problem sets.
- 30% Midterm exam, in class.
- 50% Final exam, a take home project.

Course Outline

Lecture 1: (Apr 11th, 08:45-10:15) Introduction and Motivation

Lecture 2: (Apr 11th, 10:30-12:00) Definition of a Game, Dominance, Nash Equilibrium

Lecture 3: (Apr 18th, 08:45-10:15) Mixed Strategies and Existence of Nash Equilibrium

Lecture 4: (Apr 18th, 10:30-12:00) Equilibrium Refinements

Lecture 5: (Apr 25th, 08:45-10:15) Extensive Form Games

Lecture 6: (Apr 25th, 10:30-12:00) Subgame Perfect Equilibrium

Golden Week Break

Days 7 & 8: (May 9th, 08:45-10:15 & 10:30-12:00) Midterm

Two-part exam with a 15-minute break.

Lecture 9: (May 16th, 08:45-10:15) Review and Bayes Theorem

Lecture 10: (May 16th, 10:30-12:00) Types and Bayesian Games

Lecture 11: (May 23rd, 08:45-10:15) Sequential Equilibrium

Lecture 12: (May 23rd, 10:30-12:00) Repeated Games I

Lecture 13: (May 30th, 08:45-10:15) Repeated Games II

Lecture 14: (May 30th, 10:30-12:00) Markov Perfect Equilibrium

Day 15: (Jun 6th, 08:45-10:15) Final Exam