

GAME THEORY - SYLLABUS 2023

Class timing: Monday and Wednesday 9:30 AM to 11 AM.

Instructor: **Debasis Mishra**; Teaching assistant: **Vilok Taori**

Course material: <http://www.isid.ac.in/~dmishra/game1.html>

The focus of the lectures will be to familiarize students on the fundamental ideas of game theory.

The following is a broad set of topics will be covered in the course:

1. Strategic-form games.
 - (a) Dominance
 - (b) Nash equilibrium
 - (c) Existence: (i) convex strategy sets (ii) mixed extension; computation
 - (d) Two player zero-sum games
 - (e) Correlated rationalizability and iterated elimination of dominated strategies
 - (f) Correlated equilibrium
2. Bayesian games
 - (a) Types and Bayes-Nash equilibrium
 - (b) First-price auction
 - (c) Bilateral trading
3. Repeated Games
 - (a) Infinitely repeated games
 - (b) Nash Folk theorem
 - (c) Subgame perfect equilibrium and perfect Folk theorem (reversion to Nash)
 - (d) One-shot deviation principle
 - (e) Tacit collusion

4. Extensive form games: perfect information
 - (a) Game trees and extensive forms
 - (b) Reduced form and Nash equilibrium
 - (c) Backward induction and subgame perfect equilibrium
 - (d) Mixed and behavior strategies
 - (e) Alternating offers bargaining

5. Extensive form games: incomplete information
 - (a) Perfect Bayesian equilibrium
 - (b) Sequential equilibrium

Tutorial sessions will be held by the teaching assistant. Tutorials will cover assignments and other problems.

EVALUATION. There will be **assignments**, a midterm exam, and a final exam. Each assignment will be given a week to turn in. You will be asked to submit the assignments individually.

This is an approximate distribution of weights.

1. Assignments: 20%
2. Midterm: 30%
3. Finals: 50%

TEXTBOOK: Classnotes will be provided. Following books are good references.

- *A Course in Game Theory* by **Martin J. Osborne and Ariel Rubinstein**.
- *Game Theory* by **Michael Maschler, Eilon Solan, and Shmuel Zamir**.