Game Theory - Syllabus 2025

Class timing: Monday and Wednesday 9:30 AM to 11:00 AM.

Instructor: **Debasis Mishra**; Teaching assistant: **Varun Bansal**

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

The focus of the lectures will be to familiarize students on some of 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 on Wednesday 4 PM. 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**.
- *Game Theory for Applied Economists* by **Robert Gibbons**.