

THEORY OF MECHANISM DESIGN

SYLLABUS FOR FALL 2026

Timing: Tuesday and Thursday 11:30 AM to 1:00 PM

<http://www.isid.ac.in/~dmishra/game.html>

The focus of the lectures will be on the fundamentals of the theory of mechanism design.

GRADING. Mid-term examination will have 30% weight and the final examination will have the remaining 50% weight. The remaining 20% weight will depend on the size of the class. For small class size, I will put up readings which you will read and write a referee report. For large class size, I will give regular assignments.

SYLLABUS. The following topics will be covered in the course:

1. Mechanism design: revelation principle
2. Strategic voting model
 - Gibbard-Satterthwaite Theorem
 - Single-peaked preferences and possibilities
 - Randomization
3. Basic matching theory
 - Object assignment model: fixed priority mechanism, top trading cycle mechanism
 - Two-sided matching model: stability, deferred-acceptance algorithm
 - Two-sided matching with priorities
4. Auction design
 - Myerson's optimal auction
 - Cremer-McLean full surplus extraction
 - Border's theorem

5. Procurement design

- Unknown cost
- Procurement
- Unknown demand

6. Redistribution mechanisms

- Myerson-Satterthwaite theorem
- dAGV mechanism
- property rights and budget-balance: Green-Laffont mechanism
- Cramton-Gibbons-Klemperer characterization

7. General mechanism design in quasilinear environment

- Efficiency: Vickrey-Clarke-Groves mechanism
- Combinatorial auction

8. Multidimensional screening: linear programming formulation, revenue monotonicity

REFERENCES. Classnotes will be provided. Following books are good references.

- *An Introduction to the Theory of Mechanism Design* by **Tilman Borgers**.
- *Mechanism Design: A Linear Programming Approach* by **Rakesh Vohra**.
- *Auction Theory* by **Vijay Krishna** - Chapter on Mechanism Design.
- *Microeconomic Theory* by **Mas-Collel, Whinston, and Green** - Chapter 23.
- *Algorithmic Game Theory* by **Nisan, Roughgarden, Tardos, and Vazirani** - Chapters 9, 10, and parts of 11.