SS 205C Spring 2022

Foundations of Economics

1. **Instructor:** Farzad Pourbabaee

Email: [far@caltech.edu](mailto:far@caltech.edu)

Classroom: Baxter 125

Lectures: M/W 10:30-12

2. **Course Description:** This course covers a range of topics on Social Choice Theory, Incentives and Mechanism Design, Auction Theory, Asymmetric Information (Adverse Selection and Moral Hazard) and Contract Theory.

3. **Recommended** **Textbooks:**

* A. Mas-Colell, M. D. Whinston and J. R. Green, “Microeconomic Theory”, 1995. (MWG).
* T. Börgers, “An Introduction to the Theory of Mechanism Design”, 2015. (B)
* V. Krishna, “Auction Theory”, 2nd Edition. (K)

**Tentative Outline:**

**Week 1:**

* Overview of the course including the topics to be covered and announcing the grading scheme.
* Sections 21.A and 21.B of (MWG).
* Sections 21.D and 21.E of (MWG).
* Recommended: E. Maskin, “Nash Equilibrium and Welfare Optimality”, The Review of Economic Studies, 1999.

**Week 2:**

* Single agent selling mechanism; direct mechanisms; revelation principle; revenue equivalence theorem; IC and IR conditions: Chapter 2 of (B).

**Week 3:**

* Linear programming approach to mechanism design.
* Nonlinear pricing and expected revenue maximization: Chapter 2 of (B).
* Envelope Theorem: P. Milgorm and I. Segal, “Envelope Theorems for Arbitrary Choice Sets”, Econometrica, 2003.

**Week 4:**

* Sections 23.B and 23.C of (MWG).
* Standard Mechanism Design setup; efficiency concepts.
* Examples from abstract social choice, public project and private good allocation.
* Definitions of direct mechanism and truthful implementation.
* Introducing dominant strategy implementation.

**Week 5:**

* Sections 23.C and 23.D of (MWG).
* Cont. dominant strategy implementation: revelation principle and Groves Mechanism.
* Gibbard-Satterthwaite Theorem.
* Bayesian implementation: revelation principle and expected externality mechanism.

**Week 6:**

* Review of dominant strategy and Bayes-Nash incentive compatible transfers.
* Participation constraint and interplay with efficiency; Section 23.E of (MWG).
* Ex ante, interim and ex post efficiency.

**Week 7:**

* Section 23.7 of (MWG).
* Optimal Bayesian Mechanisms.
* Myerson’s revenue equivalence in general quasilinear settings.
* Sections 13.A and 13.B of (MWG).
* Introduction to adverse selection in labor markets.