

## Fall 2011: Econ 830 – Game Theory

Instructors: Tarun Sabarwal and Jianbo Zhang

Economics 830 is a graduate course in game theory with applications. The primary objective of this class is to provide Ph.D. students with some of the fundamental ideas in game theory, upon which a student may build original research. These ideas should be useful for both (1) research in game theory, and (2) applying game theory to research in other fields. In both cases, an explicit goal is preparation for research. Consistent with this objective, students are expected to possess a good understanding of graduate microeconomic theory, as covered in Econ 801 and Econ 802.

The required text for this class is *A Course in Game Theory*, by Martin Osborne and Ariel Rubinstein, The MIT Press. Material may also be drawn from other texts, such as *Microeconomic Theory*, by Mas-Colell, Whinston, and Green, Oxford University Press, and *Game Theory for Applied Economists*, by Robert Gibbons, Princeton University Press. More advanced coverage is provided in *Game Theory*, by Fudenberg and Tirole, The MIT Press, and in the *Handbook of Game Theory*. References to relevant research articles are available in all these texts.

Grading: The course consists of two parts. Each part shall be graded by the corresponding instructor and will count for one-half of the final grade.

Part I: Basic game theory: Professor Sabarwal (Snow 331, 864-2847, [sabarwal@ku.edu](mailto:sabarwal@ku.edu))

1. Strategic form games
  - a. Basic games in normal form
  - b. Bayesian games
2. Extensive form games with perfect information
3. Solution concepts with applications
  - a. (Pure strategy) Nash equilibrium
  - b. Mixed strategy equilibrium
  - c. Correlated equilibrium
  - d. Rationalizability
  - e. Bayesian Nash equilibrium
  - f. Subgame perfect equilibrium
  - g. Relationships

Part II: Imperfect Information and Extensions: Professor Zhang (Snow 236, 864-2861, [jbzhang@ku.edu](mailto:jbzhang@ku.edu))

1. Refinement of Nash equilibrium in Strategic forms:
  - a. Strict Nash and Dominance
  - b. Perfect Equilibrium
  - c. Proper Equilibrium
  - d. Evolutionary Stability
2. Refinements of Nash Equilibrium in Extensive Forms:
  - a. Sequential Equilibrium
  - b. Forward Induction
3. Repeated games
4. Applications
  - a. Principal Agent Problem
  - b. Job Market Signaling
5. Cooperative games
  - a. The Core
  - b. Bargaining Set
  - c. Nucleolus
  - d. Shapley Value