

Scribe notes: Students will be asked to take turns preparing "scribe notes" for posting on the course web site. Each class, one student will be the designated "scribe", taking careful notes during class, writing them up, and sending them to me for posting on the web. I will post more information on how to be a scribe. Signing up to be a scribe is not compulsory, but I will give credit for doing it.

Grading:

Problem sets	40
Take Home Midterm Exam	20
Take Home Final Exam	40
(Scribe notes)	(10)

Topics: By and large, we will be focusing on Combinatorial Games, Two-Person Zero-Sum Games, Two-Person Non-Zero-Sum Games and N-person Games. If time permits, we will discuss a few topics from Algorithmic Game Theory. Here is a tentative list of topics (bullets do not correspond precisely to lectures)

- Matrix games: dominance, saddle points, mixed strategies
- Minimax theorem (John von Neumann)
- Game trees
- Combinatorial Games: Take-away games, Nim, Graph games
- Linear programming and game theory
- Applications to Anthropology - Jamaican fishing
- Applications to Warfare - Guerrillas, Police and Missiles
- Applications to Philosophy - Newcomb's problem and free will
- Nash Equilibria and Non-cooperative Solutions (guest lecturer - John Nash)
- Prisoner's Dilemma
- Strategic Moves

- Application to Biology - Evolutionary stable strategies
- Nash Arbitration and Cooperative Solutions
- Application to Economics - The Duopoly Problem
- Introduction to N-person Games
- Imputation, Domination, and Stable sets
- The Shapley Value
- Application to Politics: the Shapley-Shubik Power Index
- Application to Politics: the Banzhaf Index and the Canadian Constitution
- Bargaining Sets
- Application to Politics: Parliamentary Coalitions
- Stable Marriage Problem and the Deferred Acceptance Algorithm
- The Nucleolus and the Gately Point
- Application to Economics: Cost Allocation in India
- Mechanism Design
- Potential Games, Congestion Games, Price of Anarchy
- Combinatorial Auctions