

## EC/PS 172: GAME THEORY

- INSTRUCTOR: Federico Echenique.  
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Lectures: TuTh 1–2.25pm, 228 Baxter  
Office Hours: Wednesdays 8.30-10.30am  
Class homepage:  
<http://www.hss.caltech.edu/~fede/ec-ps172/>
- READINGS. The required text is “An introduction to game theory,” by Martin J. Osborne; 2003 Oxford University Press. Some students also find “Game Theory for Applied Economists,” by Robert Gibbons (Princeton University Press, 1992) useful. Two more advanced texts are “A Course in Game Theory,” by Martin J. Osborne and Ariel Rubinstein (MIT press, 1994) and “Game Theory” by Drew Fudenberg and Jean Tirole (MIT press, 1991).
- GRADING. There will be two short in-class “midterms,” and one final exam. The first midterm is on April 16th; the second on May 12th. Each midterm counts for 20 % of the grade. The final is a closed-book take-home exam, which you can do on June 5, 8 or 9 (seniors must take it on June 5). The final counts for 60 % of the grade.
- COURSE OUTLINE.
  1. Introduction to strategic uncertainty: perfect-information games and backward induction.  
Applications: Stackelberg duopoly, “buying votes,” and races.
  2. Normal-form games. The Domination Theorem. Rationalizability and iterated deletion of dominated strategies.
  3. Nash equilibrium. Existence and justification of Nash. Bayesian Nash Equilibrium.  
Applications: Auctions, war of attrition, electoral competition, the Kitty Genovese game, and voting in juries.
  4. Zero-sum games. Minmax theorem.
  5. Extensive-form games. Subgame-perfect Nash equilibrium. Repeated games, and Folk Theorems.  
Applications: Oligopoly, inflation.

6. Signaling games. Perfect Bayesian equilibrium. Domination and equilibrium-domination refinements.

Applications: Spence's job-market signaling model. Strategic information transmission (cheap talk). Open and closed legislative rules.