Microeconomic Theory II - Ec 204
Spring Semester

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Course description The course studies equilibria of individual decisions that face exogenous and strategic uncertainty, with variations in rationality, information, and timing. Applications clarify the relations between individual and group optimality, and between informational asymmetry and incentives, signals, and contracts. Applications address pricing, deterrence, location, bargaining, compensation, job & insurance markets, capital structure, taxation, auctions, public goods provision, reputation, cooperation. Throughout, the two fundamental welfare theorems clarify the multiple causes of inefficient equilibria.

Course objective To practice the application of key principles of strategic equilibrium analysis

References (clickable)
Class site
Lecture notes in non-cooperative game theory by J. Levin (provided)  L
Game Theory for Applied Economists by R. Gibbons (required)  G
Microeconomic Theory by A. Mas-Colell, M. Whinston & J. Green (recommended)  MWG
Advanced Microeconomic Theory 3rd ed. by G. Jehle and P. Reny (recommended)  JR
Microeconomic Analysis by H. Varian (recommended)  V
Contract Theory by P. Bolton and M. Dewatripont (for applications and extensions)  BD
Strategy: An Introduction to Game Theory by Joel Watson (basic)  W

Grading The score in the course will average scores in homework (weight .3), midterm exam I (weight .2, February 24), midterm exam II (weight .2, March 24), and final exam (weight .3, May 7, 12-2pm). A pre-approved/emergency excuse for missing a midterm exam would qualify the final exam to weigh .5 in the course score.

Homework Homework will be posted on Trunk on Thursdays and be due in class on Wednesdays. You may work in groups, but must submit your own solutions. You will learn and enjoy the problems better, if before you work in groups you work by yourself. To incentivize you to invest in homework, the path to learning, exams will be variations and simplifications of it.

Cheating Cheating in exams would trigger removal from the course and a report to the dean. However, you may bring a two-sided cheat sheet to any exam, so long as you write it by hand.

Accommodations If Tufts recognizes that you need extra time in exams, please email me.
Tentative schedule

**Expected Utility and Risk | week 1: V 11**


Measures of risk aversion and risk premium, the CARA-normal and CRRA-lognormal cases. Objective measures of risk.

**The Fundamental Welfare Theorems | weeks 2-3.5: V 17.6-.7 & 18.6-.7**

Exchange and production economies. Optimality assumptions on consumers and firms.

Definition of Walrasian equilibrium. First and Second Welfare Theorems: statement and proof.

Discussion: ideological debate, underlying assumptions, conceptual guides to market failures

**Static Games of Complete Information | weeks 3.5-5: L 1, V 15**


Beliefs, mixed Strategies, and expected payoffs. Common knowledge of rationality.

Undominated strategies and best responses to beliefs. Equivalences between them.

Iterated dominance and rationalizability. Applications: location choice, social unrest


Applications: Cournot & Bertrand duopoly, Median & Strategic Voter, Capacity Constraints

Nash equilibria and evolutionary steady states.
Static Games of Incomplete Information | week 6: L 2, G 3

Incomplete information: sealed bid auction, public good provision.

Bayesian games. Harsanyi’s conversion to normal form games.

Strategies and Bayesian-Nash equilibrium.

Applications: sealed bid auction, market for lemons, provision of public good, Cournot duopoly

Direct mechanisms, truth-telling, and the revelation principle for Bayes-Nash equilibrium

Dynamic Games of Complete Information | Weeks 7-10: L 3 & 4, G 2, V 14

Extensive form games. Potential entry, Stackelberg duopoly

Perfect information: Nash equilibrium vs Backward Induction Equilibrium.

Applications:
- advertising
- capacity deterrence
- price discrimination: first degree & third degree (Metcalf’s H 12 on monopoly), dynamic
- dynamic price discrimination


Applications of SPE:
- finite and infinite sequential bargaining. Possibility of cooperation and the folk theorem.
- collusion in prices; collusion in quantities; collusion across markets.
- efficiency wages; workplace tournaments
- bank runs
- monetary policy
Examples of games of incomplete information.

Signaling class: students in the job market, IPO’s, monetary policy, pre-trial negotiation

Inadequacy of SPE. Perfect Bayesian equilibrium. Sequential equilibrium. The intuitive criterion.

Analysis of job market signaling. (L 5)

Analysis of insurance screening. (JR 8.1.3, T notes)

Price discrimination: second degree (Metcalf’s H 12 on monopoly)

Principal-agent problem (JR 8.2, T notes)

Models of reputation. Building reputation for toughness. Cooperation in finitely repeated Prisoner’s Dilemma. (L 5)

**Extensions and Topics**

Bargaining problems and Nash’s bargaining solution. The case of quasi-linear utilities. (T notes)

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Bargaining among coalitions: the Shapley value (MWG 22.F)

Social choice and Arrow’s impossibility theorem (JR 6.2, MWG 21)

Incentives and mechanism design (G 3.3, JR 9.4, V 23.8-.9, MWG 23)

Negotiation equilibrium. Application: The hold-up problem with unverifiable investment.

Cheap talk: sender-receiver games. (L 5, G 4.3.A)

Further models of signaling (BW 3)

Further models of screening (BW 2.1-.2)