

**Econ 60102
Spring 2025
Professor Thomas Gresik**

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This course meets on Mondays and Wednesdays from 8:45 am to 10:45 am in Corbett E478.
TA sessions are held on Thursdays from 5 pm to 6:15 pm in JNH B071 and are led by Jacob Hukill (jhukill@nd.edu).

Main Text: *Microeconomic Theory*, Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green, Oxford 1995. The game theory is presented in a slightly less comprehensive way than in Fudenberg and Tirole, but its introductory coverage is very good and the end of chapter problems are helpful.

Other Useful Texts For This Course:

Thinking Strategically, Avinash K. Dixit and Barry J. Nalebuff, Norton, 1991. Simple intuition, quick read.

Game Theory for Applied Economists, Robert Gibbons, Princeton, 1991. Basic applications, modest scope.

A Course in Game Theory, Martin J. Osborne and Ariel Rubinstein, MIT Press, 1994. Good treatment of core theory.

Game Theory, Drew Fudenberg and Jean Tirole, MIT Press, 1991. Comprehensive and detailed.

I recommend that you treat the above texts as complements and not substitutes for class lectures. There will be some topics in the texts that I will cover in more detail and some topics that I will cover in less detail or skip for the sake of time. You are not responsible for topics not covered in class.

Course Objectives: The purpose of the microeconomic theory sequence is to train you in the fundamental models and the systematic, analytic techniques used in microeconomic research. The focus this semester will be primarily on the models and techniques associated with game theory and mechanism design.

Your goals for this semester should be to

1. Master the analytic techniques presented in this course.
2. Develop your skill in analyzing economic problems in a **systematic** manner.
3. Learn the detailed structure of the economic models covered this semester.
4. Learn to use intuitive and graphical explanations of economic problems to help explain the results of formal economic analysis.

Exams: There will be one midterm and a final. The midterm will be given on Wednesday, March 5 and will cover topics 1 – 3. The final exam will cover the material in topics 4 – 6. The date and time for the final exam will be announced when it is available.

Homework: Homework will be assigned on a regular basis. Students are expected to turn in complete assignments on time. In addition to assigned problems, you would do well to tackle as many problems as possible at the end of each chapter in MWG. I recommend the A-level and B-level problems for practice. Students are encouraged to attempt every homework problem on his or her own before discussing one's analysis with classmates. Your focus should be on learning how to set up and analyze problems systematically, even when the answer seems apparent.

Syllabus

1. Strategic (Normal) Form Games of Complete Information (MWG 7-8; FT 1,2.1)

- A. Definition
- B. Examples
- C. Dominant Strategies and Rationalizable Strategies
- D. Nash Equilibrium
- E. Mixed Strategies
- F. Refinements: Payoff Dominance, Risk Dominance, Perfection
- G. Stability (Best-response dynamics)

2. Extensive Form Games of Perfect and Imperfect Information (MWG 9; FT 3, 4.3, 5.1)

- A. Definition
- B. Examples
- C. Relationship to Strategic Form Games
- D. Sequential Rationality and Subgame Perfection
- E. Commitment Games
- F. Finitely Repeated Games
- G. Infinitely Repeated Games (MWG 12D, chapter 12, appendix A, and chapter 9, appendix A)
 - i. Folk Theorems

3. Strategic Form Games of Incomplete Information (MWG 8; FT 6.1 -6.5)

- A. Definition
- B. Examples
- C. Bayes-Nash Equilibrium
 - i. Bilateral Bargaining
 - ii. Auctions
 - iii. Market for Lemons

Midterm

4. Dynamic Bayesian Games (FT 8.1 – 8.3)

- A. Weak Perfect Bayesian Equilibria
- B. Signaling Games (MWG 13)
- C. Equilibrium Refinements
- D. Competitive Markets and Signaling

5. Principal-Agent Games: Moral Hazard (MWG 14)

- A. Optimal contract
- B. First-order approach

6. Screening Games

- A. Competitive Markets and Screening – Insurance Markets (MWG 13)
- B. Principal-Agent Games: Screening (MWG 14)
 - i. Auctions
 - ii. Monopoly Screening
 - ii. Regulating a Monopolist
- C. Mechanism Design/Revelation Principle (MWG 23; FT 7.2 – 7.3)
- D. Optimal Auctions and Revenue Equivalence (MWG 23)
- E. Efficient Mechanisms – VCG (MWG 23)
- F. Effort Assignment
- G. Bilateral Bargaining (MWG 23.E, FT 7.5.2)
- H. Countervailing Incentives

7. Cooperative Game Theory

A. Nash Bargaining Solution

B. Shapley Value