

**Course Objective:** The objective of the course is to study some important and interesting topics in microeconomic theory. A detailed list of topics is given below.

**Texts:** The course materials will be primarily notes based. The main texts to be used are:

Andreu Mas–Colell, Michael D. Whinston and Jerry R. Green: *Microeconomic Theory*, First Ed., Oxford University Press, 1995.

Hal R. Varian: *Microeconomic Analysis*, Third Ed., Norton, 1992.

Other useful texts are:

David M. Kreps: *A Course in Microeconomic Theory*, First Ed., Princeton University Press, 1990.

Geoffrey A. Jehle and Philip J. Reny: *Advanced Microeconomic Theory*, Third Ed., Addison–Wesley, 2011.

**Course Requirements:** There will be two midterm examinations (20% each) and a final (40%) for the final grade. The remaining 20% of the course grade will be based on problem sets. These will be handed out in the class on a regular basis. The due dates for the problem sets will be determined as we progress through the semester. The problem sets will further the understanding of the materials covered in the class. The students are encouraged to work in groups to complete the home work assignments, but each student must turn in his/her own assignments. The problem sets will be graded on a check plus, check, check minus system.

**Honor Code:** The Notre Dame Academic Code of Honor Pledge (available at: <https://honorcode.nd.edu/>) is observed in this course. Notre Dame students are expected to abide by Academic Code of Honor Pledge. “As a member of the Notre Dame community, I acknowledge that it is my responsibility to learn and abide by principles of intellectual honesty and academic integrity, and therefore I will not participate in or tolerate academic dishonesty.”

**Office Hours:** My office hours will be by appointment in JNH 3076. My office extension is 1–7590 and e–mail address is *rath.1@nd.edu*. The students are strongly encouraged to meet with me to discuss the course material.

## Topics:

1. Basic Mathematics: MWG, Appendices. (3 Lectures)
  - Euclidean spaces: Convergence of sequences. Closed, open, bounded and compact sets. Continuous functions. Weierstrass theorem.
  - Correspondences: Upper and lower hemicontinuous correspondences. The maximum theorem. Quasi-concavity and convexity of the argmax set.
  - Convexity: Brouwer's and Kakutani's fixed point theorems. Separation theorems. Theorem of alternatives (Minkowski-Farkas lemma).
  - (Optional) The minimax theorem.
2. General Equilibrium: MWG, Chs. 10, 15–18. (6 Lectures, 9)
  - Exchange economies. First and second welfare theorems. Existence of equilibrium (proof with strictly convex preferences, as in MWG). The notion of core and a refinement of the first welfare theorem. Core convergence.
  - Production economies. Robinson Crusoe economies. Basic properties of production sets. Equilibrium with transfers. Statement (no proof) of first and second welfare theorems.
3. Basic (noncooperative) game theory: MWG, Chs. 7–9. (6 Lectures, 15)
  - Normal form games and Nash equilibrium. Proof of Nash's theorem.
  - Extensive form games and subgame perfect Nash equilibrium (SPNE).
  - Repeated games. Finitely and infinitely repeated games. The (Nash threat) folk theorem. Stick and carrot strategies. The general (Fudenberg and Maskin) folk theorem.
  - Applications: Cournot duopoly and other oligopolistic models.
4. Bargaining: MWG, Ch. 22. (2 Lectures, 17)
  - Nash and Kalai-Smorodonski bargaining solutions.
  - Alternative offers (Rubinstein's) model of bargaining.
5. Social choice theory: MWG, Ch. 21. (3 Lectures, 20)
  - Condorcet paradox. Arrow's impossibility theorem. Paretean liberal.
  - Strategic voting and the Gibbard-Satterthwaite theorem.
6. Bayesian games: MWG, Chs. 8, 13–14. (5 Lectures, 25)
  - Bayesian games. Bayes-Nash equilibrium.
  - Signaling games. Perfect Bayes-Nash equilibrium.
7. Other topics: (2 Lectures, 27)