

Course Objective: This course will focus on some important and interesting topics in modern micro economic theory. There are three related objectives for this course:

- to familiarize students with important analytical techniques of micro theory and their applications to the study of various economic phenomena,
- to help students to cultivate the ability to critically evaluate the usefulness and limitations of economic models, and
- to encourage students to explore how they can use the concepts in the study of other phenomena.

The topics cover a broad range of economics. A detailed list is given below. Each of these topics will be discussed with mathematical rigor. This will expose the students to current mathematical techniques used in economics and to the usefulness and limitations of the economic models.

Course Structure: There is no required text. Extensive handouts will be provided for each topic. These may be supplemented by selective readings of various texts and articles. Exercises assigned on each topic will further enhance the understanding of the topic.

Course Requirements: The requirements for this course are:

Problem Sets (Three)	24%
Assignment/Project (One)	8%
Midterm Exams (Two)	36%
Final Exam	32%
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Total	100%

There will be *three* homework assignments during the semester. There will be *one* project (assignment) in the second half of the semester on a topic covered in the course. Students will form groups to work on the project. There will be *two* midterm exams and *one* final for the course. The final exam will be comprehensive. Students must take all the exams at the scheduled times.

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.”

Miscellany: I will hold *Office Hours* online on a regular basis, times to be announced later. You are strongly encouraged to discuss with me questions you may have regarding the course material. My office extension is 1-7590 and email address is *rath.1@nd.edu*.

Topics:

1. Choice under Uncertainty
 - Lotteries and expected utility. Expected utility representation theorem.
 - Risk aversion and concave utility functions.
 - Optimal insurance. Measures of risk aversion. Portfolio choice.
2. General Equilibrium
 - Exchange economies. Competitive and Pareto optimal allocations.
 - The first fundamental theorem of welfare economics.
 - Core allocations and core convergence in large economies.
 - Production and Robinson Crusoe economies.
3. Existence of Nash Equilibria in Games
 - Normal form games. Pure and mixed strategies.
 - Nash equilibrium. Brouwer’s fixed point theorem.
 - Proof of existence of Nash equilibrium.

4. Transferable Utility Games
 - Set of players. Coalitions. Characteristic functions.
 - Core of a game. The Shapley value.
5. Topics in Matching
 - One-to-one and many-to-one matching markets.
 - Existence of stable matches. Deferred acceptance algorithms.
 - Optimality of matchings.
 - Strategy-proofness.
6. Social Choice Theory
 - Aggregation of individual preferences to social preference.
 - Arrow's impossibility theorem. Impossibility of a Paretian liberal.
7. Externality
 - Production and consumption externalities.
 - Solutions to the externality problem: Pigovian taxes, Quotas, Property rights.
 - Efficiency under externalities. Demand revealing mechanisms.
8. Other Topic(s)?

Important Dates:

	Date	Day	Event
1.	Sep 01	Thu	Pick up HW 1
2.	Sep 13	Tue	Due HW 1
3.	Sep 22	Thu	Pick up HW 2
4.	Oct 04	Tue	Due HW 2
5.	Oct 11	Tue	<i>Midterm 1</i>
6.	Oct 27	Thu	Pick up HW 3
7.	Nov 08	Tue	Due HW 3
8.	Nov 15	Tue	<i>Midterm 2</i>
9.	Dec 06	Tue	<i>Project Answer is Due</i>
10.	Dec 12	Mon	<i>Final</i>
	10:30 AM		