

ROCHESTER INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ECONOMICS

0511-464- GAME THEORY WITH ECONOMIC APPLICATIONS

Professor: Dr. Shatakshee Dhongde
Class Room: Bldg. 76, Room 1210
Class Time: MW 10 a.m. to 11.50 a.m.

Office: 01-1336
Office Hours: MW Noon to 2.p.m.
Email: Shatakshee.Dhongde@rit.edu

Course Description:

Games of strategy are part of our everyday life. We play them with our parents, siblings, spouse, professors and our employers. Similar games are played in business, politics, diplomacy and wars. Game Theory studies these games in a rigorous fashion. Game theory helps us predict outcomes in situations of strategic interdependence. It provides techniques of analysis useful in many disciplines including economics, business, political science, psychology, biology and philosophy.

In this course, we will study general principles of game theory. We will systematically apply these general principles to several specific contexts. Throughout the course, several examples will be provided to illustrate the concepts. These examples will be simplified versions of the complex strategic situations we see in the real world. The more the number of problems you solve for this course, the more confident you will feel about the material. Game theory started off as a branch of applied mathematics. So you will require basic mathematical tools to solve the games.

Text Book:

- **An Introduction to Game Theory** by Martin J. Osborne, Oxford University Press

Relevant Books:

- **Strategies and Games** by Prajit K. Dutta, The MIT Press
- **Games of Strategy** by Avinash Dixit and Susan Skeath, W. W Norton Publishers
- **Game Theory for Applied Economists** by Robert Gibbons, Princeton University Press

Course Outline:

1. **Introduction**
2. **Decision Making under Uncertainty:** Expected Utility
3. **Simultaneous-move Games:** Pure Strategies, Normal Form, Classical examples
4. **Nash Equilibrium:** Definition, Solution Concept, Examples
5. **Best Response Functions:** Relation to Nash equilibrium
6. **Dominant Strategies:** Iterated elimination of dominant strategies
7. **Applications of Simultaneous-move Games:** Cournot model, Bertrand duopoly, Tragedy of the Commons

8. **Mixed Strategies:** Nash equilibrium
9. **Sequential-move Games:** Extensive form, Game tree
10. **Subgame Equilibrium:** Backward Induction solution
11. **Comparing Simultaneous and Sequential-move Games:** Stackleberg model

Course outline may be revised during the quarter.

Grading:

1. **Exam 1: 30%**

First exam is tentatively scheduled on **Monday, April 2nd 2007**

2. **Exam 2: 30%**

Second exam is tentatively scheduled on **Monday, April 30th 2007**

3. **Exam 3: 40%**

Third exam will be scheduled in the finals (11th) week of the quarter.

All exams are compulsory and should be taken on the announced day and time. There will be no makeup exams given. Final grade will depend on the weighted average of the three exams. Final letter grades will be assigned as given below:

- 91% to 100%: A
- 76% to 90%: B
- 61% to 75%: C
- 51% to 60%: D
- 50% or less: F

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