ECO 5464
Game Theory and Industrial Organization
Syllabus

University of Florida

Fall 2020

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Virtual Office Hours (Zoom): Mondays & Wednesdays 2:30PM-4:00PM; and by appointment

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Virtual Office Hours (Zoom): Wednesdays 4:00PM-5:30PM

Course Description:

Noncooperative game theory is the analytic framework used to formally analyze strategic interaction, which occurs when each player's actions affect the other players' well-being, and relationships are of the rivalrous nature. The course combines theoretical models with some applications of game theory to industrial organization. Industrial organization is the branch of Microeconomics that is concerned with the study of imperfect competition (i.e., functioning of markets with few competitors). The presence of a small number of competitors creates situations of strategic interactions among the market participants. The course will consider the analysis of game theoretic methods

to study oligopolistic firm behavior in a variety of scenarios, ranging from simple forms of static competition to complex dynamic games involving strategic behavior. We will also study applications such as horizontal merger policy and merger evaluation, bargaining, or auctions.

Textbook and Readings:

There are no required textbooks for this course. Some recommended textbooks in Game Theory are:

- *Game Theory for Applied Economists*, by Robert Gibbons.
- *Games, Strategies, and Decision Making*, by Joseph E. Harrington, Jr.

A recommended textbook in Industrial Organization is Pepall, Richards and Norman, *Industrial Organization: Contemporary Theory and Applications*, 2014, Fifth Edition.

Lectures and Course Communication

The course will be held asynchronously online. The lectures will be recorded and organized into videos. I will share the links to the videos on Canvas. The lectures will be posted to Canvas on Mondays and Wednesdays, following the course schedule. You are strongly encourage to watch each lecture in a timely fashion (i.e., within 1 day of each being posted). As in all courses, unauthorized sharing of recorded materials is prohibited.

While this course is delivered online, there will be some synchronous activities, such as exams. Exams will take place during our assigned class time: Mondays and Wednesdays during 3rd and 4th periods. You are expected to be available during those times.

Announcements concerning the class will typically be made in lecture videos and through Canvas. You are responsible for all information made available through both of these avenues of communication.

Evaluation and Grading:

Evaluation will be based on problem sets (10% of the total grade), and two midterm examinations. The exams will be closed book/closed note exams administered online in Canvas using the Honor Lock proctoring service. All exams will be taken synchronously (i.e., at the same time). The first midterm examination (45% of the total grade) will take place on Wednesday October 14 at 9:35am (Eastern Standard Time zone). The last exam (45% of the total grade) will be held the last day of class, on Wednesday December 9 at 9:35am (Eastern Standard Time zone).

The course is divided into two parts, each followed by an exam that focuses mostly on the current part. Make-up exams will be administered only on those circumstances in which you cannot take an exam for a valid reason, such as illness or emergency (see UF policy on this). **In that case, you should notify me prior to the start of the examination. A zero exam score will be assigned if you miss an exam for an unexcused reason.** Please also note that providing false documentation or creating an excuse to be excused from class that cannot be verified constitutes cheating under the University guidelines. UF policy on academic honesty will be strongly enforced.

There will be at least 6 problem sets. Due dates for the assignments will be announced in class (all times announced in class will be according to Eastern Standard Time). **All assignments are due on Canvas before the deadline on the due date. Late submissions will not be accepted and will receive zero credit**. As a general advice, make sure to submit your assignment at least several hours before the due date/time. In addition, after submitting your problem set through Canvas, make sure your submission is correct and contains all pages. If necessary, you will be able to replace your initial submission with an updated version before the deadline. You are responsible for verifying that any online assignment submission has properly been submitted through Canvas. Your lowest problem set grade will be dropped.

Your final letter grade will be determined based on a curve at the end of the semester. The distribution of the grades will depend on the overall performance of the class.

Computer Access

The University requires access to and on-going use of a computer. This should not be a tablet device or smartphone, but an actual desktop or laptop computer. To succeed in this course, you will also need a stable internet connection and appropriate space to

take online exams using the Honor Lock proctoring service. Minimum equipment specifications are available at: https://it.ufl.edu/policies/student-computing-requirements/

Academic Honesty

You are expected to comply with the University of Florida's rules for academic honesty (which can be found here). Failure to comply with this commitment will result in disciplinary action.

Students with Disabilities

Students with disabilities requesting classroom accommodation must first register with the Disability Resource Center. The Disability Resource Center will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Topics

The following is a list of broad topics that we will be studying in this course. We will cover different applications of game theory to industrial organization within each of them.

1- Introduction to Game Theory

2- Static Games of Complete Information

- Normal-Form Representation of Games
- Dominant and Dominated Strategies
- Iterated Elimination of Strictly Dominated Strategies
- Nash Equilibrium in Pure and Mixed Strategies
- Applications: Hotelling Location Model, Oligopoly Models (Cournot Model, Bertrand Model with Homogeneous Products, Bertrand Model with Differentiated Products), Horizontal Merger Analysis.

3- Dynamic Games of Complete Information

- Extensive-Form Representation of Games
- Backwards Induction
- Subgame Perfect Nash Equilibrium
- Applications: Stackelberg Model of Duopoly, Collusion, Sequential Bargaining.

4- Games of Incomplete Information

- Job Signaling
- Cournot Competition under Asymmetric Information
- Auctions