ECO-5341
Strategic Behavior
Spring 2020

Professor: Tim Salmon
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Meeting Times: T TH 11AM – 12:20 PM
Location: ULC 303
Office Hours: T TH 9:30-11:00 AM, & by appointment

Course Description:
Game theory is a collection of tools used to study and model strategic decision making. These methods can be used to study optimal decision making in contexts ranging from those normally viewed as "games" such as poker to situations that economists are more concerned with that can include how to place a bid in an auction, how to set prices to draw business from a competitor etc. . . This class will begin by developing the formal tools of game theory and then alternate between showing interesting applications of that theory and developing additional theoretical tools. The types of applications that will be discussed will include a study of optimal auctions, pricing games, optimal contract design, and models of election games. The goal for this class is that by the end of it, students should be able to engage in complex strategic analysis of real world situations.

Prerequisites:
The main prerequisite for the course is ECO 3301 (Intermediate Microeconomics). This class will make extensive use of mathematics. This will mostly be simple algebra and probability concepts but some basic calculus may be helpful. We will review some of these tools, but basic algebra skills will be assumed.

Course Text:
1. *Games, Strategies and Decision Making* by Joseph E. Harrington, Jr., Worth Publishers. ISBN: 1-4292-3996-4 or 978-0-7167-6630-8 (First or second edition is fine)

Student Learning Outcomes
1. Demonstrate an understanding of the basic tools of strategic analysis.
2. Be able to apply the tools of game theory to a variety of situations.
3. Be able to discuss how different types of asymmetric information structures affect incentives and market outcomes.
4. Explain the principles of market design and their application to social choice and voting situations.

Grading:
Grading for this course will consist of two midterm exams (20% each), one final exam (35%) and problem sets (25%). Numerical scores will be curved. Problem sets will likely be given out every other week.

Course Outline:
For several sections of the course, we will be using a set of interactive tools through www.moblab.com. I will create accounts for everyone on the system using your SMU emails and you will receive the login information from the site. The system runs on any laptop, smart phone or tablet and on days we use this system it will be helpful if you can bring one of those sorts of devices to class. If you intend to use an iOS or Android device, you can download an app to access the system through the relevant app store for your device. If you do not have any of these devices, you can look on with someone else. These segments are not for grades but are intended to help you develop a deeper understanding of the material.

1. Introduction
    a. Motivation: Why study Game Theory? – Chapter 1
    b. Modeling Approaches: Normal Form vs. Extensive Form and overview of utility functions – Chapter 2
2. How to solve Normal Form Games
    a. Dominant vs. dominated strategies – Chapter 3
    b. Nash Equilibrium – Chapters 4 & 6
    c. Mixed Strategies – Chapter 7

Mid-Term Exam I

3. How to solve Extensive Form Games
    a. Backwards induction – Chapter 8
    b. Equilibrium Refinements
    c. Repeated Games – Chapters 13 & 14
4. Information Theory
    a. Incomplete Information – Chapter 10
    b. Principal/Agent Problem
    c. Adverse Selection or the Lemons Problem – Chapter 11 & 12

Mid-Term Exam II

5. Mechanism Design and Auction Theory – Online Notes
6. Social Choice Theory or Models of Voting and Elections

Final Exam, Friday May 8th, 11:30 AM – 2:30 PM

University Policies

- **Disability Accommodations:** Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit http://www.smu.edu/Provost/SASP/DASS to begin the process. Once approved and

registered, students will submit a DASS Accommodation Letter to faculty through the electronic portal DASS Link and then communicate directly with each instructor to make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

- **Religious Observance:** Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence (https://www.smu.edu/StudentAffairs/Chaplain/ReligiousHolidays).

- **Excused Absences for University Extracurricular Activities:** Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (See 2018-2019 University Undergraduate Catalogue)

- **Honor Code and Academic Dishonesty:** Violations of SMU's Honor Code will be taken very seriously. Students are expected to do their own work and use only the resources approved by the instructor. Students are expected to be honest in their dealings with the instructor as well as avoid any forms of plagiarism and cheating. Students unfamiliar with the SMU Honor Code should consult the SMU Student Handbook.