

**GAME THEORY APPLIED TO BUSINESS DECISIONS
(ECO 6409 – Spring 2019)**

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Reading: Dixit, A.K. & B.J. Nalebuff, The Art of Strategy, Norton, 2008. Course Notes (available at Target Copy, 1412 W. University Ave.; or at course website). Harvard Cases (available at Target Copy only, 1412 W. University Ave.).

Website: Canvas website access at E-Learning System Entry.

Relevant chapters in the Dixit and Nalebuff book are indicated in the course outline below. Read the chapters before the lectures. The book presents game-theoretic concepts using an exceptionally applied and non-technical approach. (Other books are either much more technical and lengthy or too simplistic to be very informative.) For the interested student, a pretty good introductory textbook is Harrington, Games, Strategies, and Decision Making. The seminal advanced textbook is Fudenberg and Tirole, Game Theory. There is a set of Course Notes available at Target Copy Center or you can download them by section at the course website. I think you will find it much easier to just buy the whole package of Course Notes at Target. A small package of cases is also available *separately* at Target Copy Center. (The cases are not posted at the course website due to copyright restrictions.)

About This Course: We will study game theory applied to business decisions using a relatively non-technical approach. I am equally interested in having you develop some facility at framing business problems as would a game theorist as I am in the particular applications we pursue. I hope to convince you that viewing problems through the lens of the game theorist is very useful, while alerting you to weaknesses of the pure theory at the same time. In other masters courses you should get more opportunity to employ the ideas we study. If this course has an impact on how you think about business problems you encounter, then I will feel it has been successful.

While I have emphasized that we will approach game theory from a non-technical perspective, we must necessarily employ some basic mathematics to develop the methodology. Most of this requires no more than understanding of very basic algebra and geometry. In a few applications, we will employ (differential) calculus to solve optimization problems. While you will want to learn enough to understand what we're doing when employing calculus, i.e., understand when it is to be applied

and what its results tell us, learning the mechanics of calculus is unnecessary. (I won't ask you to take any derivatives on the final exam but you might have to do so on take-home problems.)

Course Outline (timing of topics tentative)

Monday	Wednesday	Reading
3-11; Motivation; Introduction; Examples; Prisoners' dilemma.	Game fundamentals; Start sequential games.	Chapters 1 & 2
3-18; Sequential games cont. Start simultaneous games.	Deep Pockets Case	Chapter 2, Chapter 3 to p. 72 & Chapter 4
3-25; Simultaneous move games; dominant & dominated strategies; Nash equilibrium.	Nash equilibrium cont.	Chapter 3 to p. 72 & Chapter 4
4-1; Leaders & Challengers Case; hand out homework 1.	Multiplicity of equilibria & coordination games; Battle of Networks. Randomization.	Chapter 9 up to p. 286; Chapter 5
4-8; Randomization cont; Repeated Prisoners' dilemma. Homework 1 due.	Repeated prisoners' dilemma cont.	Chapter 13; Chapter 3
4-15; Begin applications: reputation equilibrium. Hand out homework 2.	Applications; Judo economics case.	Chapters 6 & 7
4-22; Applications cont.; Pre-emptive moves, strategic product positioning, etc. Homework 2 due.	War of attrition case. Other applications as time permits.	Chapters 6 & 7
4-29; Final Exam/Regular Classroom and Time		All of the above

Grading, Teams & Ground Rules: Your course grade will be based on two team-completed homework assignments (weighted 25% each) and a final examination (weighted 50%). You can form teams of 2, 3 or 4 students on your own, or give me your name and I will place you on a team. If you form a team, provide me by e-mail all your names and student ID numbers. I encourage you to help one another learn the material within and outside your teams, but learning the material is your own responsibility (and the bell tolls at exam time). Class preparedness and participation will be noted and will influence borderline grading decisions. We'll discuss expectations regarding the team assignments and team participation when the first homework is given out (see course outline for expected dates). I will do my best to clarify the nature of the final exam as it approaches.

Professional behavior is expected always, and should be expected from me. **Attendance is required.** Come to class prepared, **on time**, etc. **Laptops are generally unnecessary and should not be opened. Phones should be turned off and stored.** I am, of course, happy to follow university guidelines in accommodating disabilities. I support your commitment to the Masters Programs, MBA, and University Honor Code.

I look forward to teaching this course!