

Game Theory and Applications

ECO 4400 Section: 0150

Class Periods: Monday/Wednesday, Periods 7-8, 1:55-3:50

Location: Matherly 119

Academic Term: Spring 2020

Instructor:

Professor Daniel Wagner

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352.294.0989

Office Hours: M W 4:05-5:05 MAT 301 or by appointment MAT 400

Course Description

Introduces modern game theory, including the formal theory of Nash equilibrium and solutions techniques.

Applications include strategic barriers of entry; cooperative behavior in oligopoly, auctions and bidding strategies; and durable goods sales.

4 credits

Course Pre-Requisites

Intermediate Microeconomics(ECO 3101) and Calculus I(MAC 2311) or equivalents

Course Objectives

Analyze and model strategic decision making by rational actors under perfect and imperfect information, study industrial organization and pricing decisions in a more mathematically rigorous context and conclude with longer games and decisions under uncertainty.

Required Textbook

- Games, Strategies, and Decision Making
- Joseph E. Harrington Jr.
- 2015, 2009, 2nd Edition
- ISBN number: 978-1-4292-3996-7

Recommended Materials

- Partial Derivatives- Khan Academy Review
<https://www.khanacademy.org/math/multivariable-calculus/multivariable-derivatives/partial-derivatives/v/partial-derivatives-introduction>

Course Schedule

Week of 1/6: Syllabus, Introduction to Game Theory, Extensive and Strategic games
Harrington Chapters 1 & 2

Syllabus Quiz

Week of 1/13: Dominant Strategies, Nash Equilibrium/
Alternate Strategies: Maximax, Maximin, Minimax Regret Solvability
Harrington Chapters 3 and 4

Quiz 1

Week 1/20: Martin Luther King Day(No Class M)/Alternate Strategies Continued/
N Player Games, Harrington Chapter 5

Problem Set 1 Due

- Week 1/27: N Player Games Continued/ Mixed Strategy Nash Equilibria, Harrington Chapter 7
Quiz 2
- Week 2/3: Mixed Strategy Cont./Subgame Perfection w/ Discrete Choice, Harrington Chapter 8
Problem Set 2 Due
- Week 2/10: Subgame Perfection Continued
Quiz 3
- Week 2/17: Exam Review/**1st Midterm**
- Week 2/24: Calculus Review/Partial Differentiation/Continuous Games/Bertrand and Cournot Duopoly; Harrington Chapter 6
- Week 3/2: Spring Break
- Week 3/9: Continuous Games/Bertrand and Cournot Duopoly Continued
Problem Set 3 Due
- Week 3/16: Infinitely Repeated Games, Harrington Chapters 13 and 14
Quiz 4
- Week 3/23: Tacit Collusion/Exam Review
Problem Set 4 Due
- Week 3/30: **2nd Midterm Exam**/Imperfect Information: Simultaneous-play, Harrington Chapter 9
- Week 4/6: Imperfect Information: Simultaneous-play, Harrington Chapter 9
Bayesian Games, Harrington Chapter 10
Quiz 5
- Week 4/13: Final Topics and Wrap Up/Exam Review
Problem Set 5 Due
- Week of 4/20: **3rd Midterm**/ Reading Days

Attendance Policy, Class Expectations, and Make-Up Policy

While not graded, attendance is required. You are responsible for the material covered in lecture. Late work will not be accepted.

Laptops are not recommended for note taking as course notes will heavily rely on diagrams that are easier to draw by hand. In class quizzes on Canvas can be taken on laptops or smartphones with a web browser or the Canvas application.

Excused absences must be consistent with university policies in the Undergraduate Catalog and require appropriate documentation. Please notify me in advance if you will be absent during a quiz or exam or when a problem set is due if at all possible. Additional information can be found here:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Evaluation of Grades

Assignment	Percentage of Final Grade
Problem Sets	20%
Quizzes	15%
Midterm Exam 1	15%
Midterm Exam 2	25%
Midterm Exam 3	25%
	100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100.0	A	4.00
87.0 - 89.99	B+	3.33
80.0 - 86.99	B	3.00
77.0 - 79.99	C+	2.33
70.0 - 76.99	C	2.00
67.0 - 69.99	D+	1.33
60.0 - 66.99	D	1.00
0 - 59.9	E	0.00

Grades will not be rounded, an 89.99 is a B+. A curve will be implemented on exams only if the class average is below 70. The homework and quizzes are intended as a buffer in addition to preparing you for the exams.

Late work will not be accepted and substitute work will not be offered.
Makeup exams must be prearranged and only for UF approved conflicts.

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

In the interests of fairness I will not deviate from the syllabus.

Course Layout

- The problem sets, readings, and quizzes are intended to prepare you for the exams. Similarly to Intermediate Microeconomics this course involves intuition that can be difficult to grasp; practice is key.
- Problem sets are due at the beginning of class and students will be selected at random without replacement to present solutions. I will assist you if you are unsure of the answer but presenting answers is not optional.
- Quizzes are in class on alternate weeks to the problem sets, first individually and then a second time with groups. This is intended to encourage study groups but both quizzes will count; you are responsible for the materials in the lectures and readings.
- While collaboration on problem sets and quizzes is allowed this is again intended as a study tool; your classmates are a valuable resource but if you don't work through the problems yourself you can trick yourself into thinking you understand the material.

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.