

ECO 4400: Game Theory and Applications Syllabus

Dr. Thomas Knight
Office: MAT 340
Office Hours: T/R 4:05-4:50pm

Fall 2016
Course Time: M/W 9:35-11:30am
Course Location: MAT 114
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Prerequisites: Principles in Microeconomics (ECO 2023 *or equivalent*) and Calculus I (MAC 2233 *or equivalent*)

Required Text: 1) "Games, Strategies, and Decision Making" by Joseph E. Harrington
2) MobLab access

FIRST WEEK READING ASSIGNMENTS	1) Read the Syllabus 2) Complete the "Student Information Form" (Page 6) 3) <i>If needed:</i> Review basic differential calculus
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STUDENT RESPONSIBILITIES --*be careful to read the syllabus for unique features of this course*

- Continued enrollment in this course is equivalent to acceptance of all stated responsibilities, policies, and due dates. If there is anything that is unclear, talk to me *immediately*. Waiting until the end of the term often results in less favorable outcomes.
- Students are expected to attend regularly and participate actively in this course. It is assumed that you have read the assigned material before attending class and are prepared to answer questions based on the readings.
- I ask a number of directed questions during the lecture period of the course. Students are selected at random (without replacement -- *in order to ensure that all students have an equal opportunity to answer questions*) to answer questions based on the required readings and lecture material. These questions are not intended to trick you or "test" you on the required readings; they are simply intended to enhance course participation. You are free to "take a pass" if you do not feel comfortable answering a particular question.
- Students are expected to complete 8 analytic problem sets. These problem sets relate to the topics of the preceding lectures and are intended to offer you practice with the relevant solution techniques. In some cases, questions offer important extensions of the material covered in class. All problem sets are due at the beginning of class (i.e., 9:35am) on the due date; late problem sets will not be accepted for partial credit. *See Page 5 for a more thorough explanation of problem sets.*
- Students are expected to present their solutions to the analytic problem sets and other in-class handouts during class. On days when problem sets are due, the first portion of the course period is dedicated to student presentations of selected solutions. Students are selected at random (without replacement -- *in order to ensure that all students have an equal opportunity to answer questions*) to present their solutions. If you are unsure of the solution, I will assist you in presenting the answer, but you will not be able to "take a pass."

Note: Students will be able to collect their problem sets from me for their solution presentations. However, you will not have your problem sets when other students are presenting. *I recommend making a photocopy of your problem set if you want to check your answers against the solutions presented in class.*

- Any lapse of appropriate conduct while a fellow classmate is presenting may result in a final course grade reduction of one letter grade. Many people are afraid to present their own work in front of their peers, and it is our shared obligation to make their presentation as painless as possible.
- Students are expected participate in 5 in-class game sessions. These games are intended to provide students with practical, hands-on experience with the game theoretic topics covered in the course. Students grades will depend both on their participation and performance.
- There are three in-class exams: Midterm 1 (Oct. 5), Midterm 2 (Nov. 2), and Final Exam (Dec. 5).

COURSE RESOURCES (AND HINTS FOR SUCCESS)

- The problem sets are the greatest resource you have. These problem sets provide an almost-comprehensive review of the relevant course material and solution techniques. I highly recommend taking thorough notes when the solutions are presented in class, as solutions are *not* handed out in class.
- I provide sample exams (with solutions). These exams offer insight into the structure and difficulty level of the actual exams, but they do not necessarily cover the same material. *Also, students regularly report that sample (or old) exams are less difficult than current term exams. Be prepared for this!*
- Superficial cramming will not lead to success; keeping up with the material is essential. After each lecture, review your notes, and test whether you understand a particular concept. You may, for example, take an example from class in which I solved for Subgame Perfect Nash Equilibrium and ask how the equilibrium would change with a certain change in the players' payoffs. These thought exercises increase your exposure to the material and sharpen your ability to apply the analytic tools covered in class.
- As with any "tools" course (e.g., mathematics), the only way to learn the material is to practice it. Take advantage of the many resources you have.

OFFICE HOURS

- You are encouraged to attend office hours; attendance is highly correlated with success in the course.
- Attempt problem sets before you bring questions to office hours; the problem sets are substantially less beneficial if you do not attempt them on your own.

GRADING POLICY AND SCALE

- Grades are calculated as follows: Analytic Problem Sets and Presentations (20%), Game Session Participation (5%), Midterm 1 (25%), Midterm 2 (25%), and Final Exam (25%).
- For each gaming session, the 15 highest performing students (as determined by a Borda scoring mechanism) will receive extra credit of ½ point on their final course grade. In the event of a tie at the extra credit threshold, all students with the score of the 15th highest performing student will receive extra credit.
- Make-up exams must be arranged before the exam date/time and will only be offered for UF-related conflicts and religious holidays. Keep in mind that your academic obligations *always* take precedence over personal and social commitments. This includes UF-related social events.
- Unexcused absences from in-class exams result in a grade of 0.
- No Incompletes No Grade Changes No Extensions No Substitute Work

92.50-100	A	77.50-79.99	C+
90.00-92.49	A-	72.50-77.49	C
87.50-89.99	B+	70.00-72.49	C-
82.50-87.49	B	65.00-69.99	D
80.00-82.49	B-	0-64.99	E

A grade of C- is not a qualifying grade for major, minor, Gen Ed, or College Basic distribution credit. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

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

---AND---

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

ANALYTIC PROBLEM SET INFORMATION AND GUIDELINES

- You are required to demonstrate all of your work and provide thorough explanations to receive credit! Attach all of your work on additional sheets of paper. The problem sets typically do not have enough space for you to provide all of your work and the required explanations.
- You may work in groups; in fact, I highly recommend it. You are, however, required to submit individual problem sets for grading. Copying another student's work is not permissible.
- Keep your problem sets when I hand them back!! Some questions refer to others from past sets.

ATTENDANCE POLICY

Irregular attendance and/or tardiness will most likely result in substantially reduced course performance, as well as reflect poorly upon your commitment to this course. There are also two ways in which attendance (or lack thereof) can result in a reduction of your final grade:

- 1) Failure to notify me - *before the class period in question* - of an absence for a class period in which you are selected to present a problem set or in-class hand-out solution will result in a 50% reduction in the “Analytic Problem Sets and Presentations” portion of your grade.
- 2) Participation in each Game Session counts as 1 point of your final grade. In order to participate, you must be present. Any absences from a Game Session must be excused in advance, and excused absences will only be offered for UF-related conflicts and religious holidays. Keep in mind that your academic obligations *always* take precedence over personal and social commitments. This includes UF-related social events.

As a precaution, notify me of all absences.

GENERAL COMMENTS ON WELLNESS AND SUCCESS

College is an exciting learning experience and a unique opportunity for personal growth. It can, however, also be a stressful and difficult transitional period. If you are ever having general issues with your coursework *in any course* or trouble in your personal life, please seek help from myself or another faculty member. I also encourage you to utilize the *FREE* and *ANONYMOUS* services of the UF Counseling and Wellness Center.

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, 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.

ACADEMIC HONESTY

You are expected to abide by the University’s rules for academic honesty. These are available for your review at <http://www.dso.ufl.edu/judicial/academic.php>. Cheating, plagiarism, and any other action that violates these rules will be prosecuted to the fullest extent. It should be noted that creating an excuse to take a make-up exam that cannot be verified constitutes cheating under the University guidelines.

END –OF-TERM COURSE EVALUATION

I encourage you to fill out the online course evaluation form that is available at <http://evaluations.ufl.edu>. I will provide class time – during which I will leave the room – for you to complete this online form at the end of the term. This will be announced in advance, and you will be encouraged to bring a wifi-enabled device (e.g., a laptop, tablet, or smartphone) to class that day.

I will pass out an alternative (separate from the official University of Florida form) course evaluation form at the end of the course. The official University of Florida form does not offer much valuable information for future improvements of this course. Please, help me and future students by offering honest and thorough information -- *I greatly appreciate constructive criticism*. I will not read these evaluations until all grades have been submitted.

COURSE OUTLINE (AND ASSIGNMENT SCHEDULE)

- L1 August 22 Syllabus
- L2 August 24 Introduction to Game Theory
Harrington, Chapters 1 and 2
Student Information Form due at the beginning of class
- L3 August 29 Dominant Strategies and Nash Equilibrium
Harrington, Chapters 3 and 4
- L4 August 31 Game Session 1
Problem Set I due at the beginning of class (9:35am).
- September 5 NO CLASS: Labor Day
- L5 September 7 Alternate Strategies: Maximin, Maximax, and Minimax Regret Solvability
Reading Assignment TBA
- L6 September 12 N-Player Games
Harrington, Chapter 5
- L7 September 14 Game Session 2
Problem Set II due at the beginning of class (9:35am).
- L8 September 19 Mixed Strategy Nash Equilibria
Harrington, Chapter 7
- L9 September 21 Mixed Strategy Nash Equilibria
Harrington, Chapter 7
- L10 September 26 Subgame Perfection in Discrete Choice Games
Harrington, Chapter 8
Problem Set III due at the beginning of class (9:35am).
- L11 September 28 Subgame Perfection in Discrete Choice Games
Harrington, Chapter 8
- L12 October 3 Exam Review
Problem Set IV due at the beginning of class (9:35am). This problem set will be made available the following day in my office.
- October 5 FIRST MIDTERM EXAMINATION
- L13 October 10 Calculus Review, Partial Differentiation, and Profit Maximization
- L14 October 12 Continuous Games
Harrington, Chapter 6
- L15 October 17 Continuous Games and Imperfect Competition
Harrington, Chapter 6

- L16 October 19 **Game Session 3**
Problem Set V due at the beginning of class (9:35am).
- L17 October 24 **Infinitely Repeated Games**
Harrington, Chapters 13 and 14
- L18 October 26 **Infinitely Repeated Games**
Harrington, Chapters 13 and 14
- L19 October 31 **Exam Review**
Problem Set VI due at the beginning of class (9:35am). This problem set will be made available the following day in my office.
- November 2 **SECOND MIDTERM EXAMINATION**
- L20 November 7 **Imperfect Information: Simultaneous-play**
Harrington, Chapter 9
- L21 November 9 **Imperfect Information: Bayesian Games**
Harrington, Chapter 10 (10.1-10.3)
- L22 November 14 **Imperfect Information: Bayesian Games**
Harrington, Chapter 10 (10.1-10.3)
- L23 November 16 **Game Session 4**
Problem Set VII due at the beginning of class (9:35am).
- L24 November 21 **Applications of Game Theory: Voting**
Reading Assignment TBA
- L25 November 23 **Applications of Game Theory: Auctions**
Reading Assignment TBA
- L26 November 28 **Game Session 5**
Problem Set VIII due at the beginning of class (9:35am).
- L27 November 30 **Exam Review**
End-of-Course Evaluations
- December 5 **FINAL EXAMINATION**

ECO 4400: Game Theory and Applications

Name:

Phone Number:

Major:

Email Address:

Year (e.g., junior):

May I include your phone number on the class list? Yes _____ No _____

May I include your email address on the class list? Yes _____ No _____

***Principles in Microeconomics* and *Calculus* are prerequisites for this course. Please confirm that you meet these requirements.**

Which economics courses have you taken? Please make note of courses that were taken as Advanced Placement (AP) or at another college or university.

Which math courses have you taken? Please make note of courses that were taken as Advanced Placement (AP) or at another college or university.

What attracts you to the study of economics? What particular areas of economic inquiry interest you?

This is an elective course. What interests you about game theory?