Course Syllabus
ECON 4550: Game Theory and Strategic Analysis
Spring 2016
3.0 credit hours

(Last updated: 1/7/2015)

Instructor: Dr. Andrew Hussey
Phone: 678-1487
E-mail: ajhussey@memphis.edu
Office: 423 Fogelman College Admin Building
Office Hours: Monday 2-2:40, Wednesday 4:05-5 & by appointment

TA: Jobu Babin (jbabin@memphis.edu)

Course Overview

This course will provide students with an introduction to game theory, the study of strategic behavior, when parties have opposed, mixed or similar interests. Students will learn an organized and systematic way of thinking about decision making and problem solving, enabling them to recognize and model strategic situations and evaluate how one's actions will influence the decisions and outcomes of others. This analysis will be applied in a variety of contexts, most notably economics and business, but also politics, international relations, evolutionary biology and everyday life. Topics will include sequential and simultaneous move games, pure and mixed strategies, various equilibrium concepts, and repeated games. The course will primarily be lecture based, but in-class interactions (games) will make up a substantial part of the course.

Pre-Requisites/Co-Requisites: ECON 2020; knowledge of calculus may be helpful, but not required. However, the course will use mathematics at the level of algebra quite often.

Texts and Other Materials:
The primary text used in this course will be *Games of Strategy, 4th Ed.* by Avinash Dixit, Susan Skeath and David Reiley, New York: W.W. Norton & Co., 2014. Note that you may instead choose to buy the 3rd edition, which may be substantially cheaper. We will also read *The Art of*

Students will also be required to purchase use of Moblab, an online application that we will use for in-class (and potentially out-of-class) games. Students will need to bring either a smartphone or laptop to class in order to participate. The cost is $9 for the semester and instructions will be provided. Students who do not have access to a smartphone or any other portable device with access to the internet should contact me at the beginning of the semester so that we can make arrangements for alternative course material to replace part of the in-class participation component of the class.

Location of Course Materials:

All homework assignments (and other course documents) will be found on the eCourseware website once they are assigned. Grades will also be posted there within a reasonable amount of time after each assignment/exam is turned in.

Course Objectives:

By successfully completing this course, students will:

1. Learn the basic structure of simultaneous, sequential and repeated games.
2. Utilize multiple concepts of equilibrium in order to solve various types of games.
3. Be able to recognize examples of many classic strategic and cooperative games in a variety of real-world venues.
4. Understand first-mover versus second-mover advantage and the contexts in which they arise.
5. Illustrate economic interactions, such as duopoly, with the use of game theory.
6. Appreciate the role of information in the outcomes of strategic interactions.

Fogelman College: Learning Outcomes for BBA
http://www.fcbeassessment.net/LearningOutcomes/BBADegreeLearningOutcomes.pdf

Grading and Evaluation Criteria

Over the semester, you will have a variety of opportunities to earn points towards your final (overall) letter grade in this course. This section of the syllabus describes the assessed work you will be doing and how overall (final) letter grades will be computed.
Evaluation Methods:

Exams: There will be three in-class midterm exams and a comprehensive final exam. Each exam will count for 15 percent of the total grade. However, if it benefits your overall grade, one midterm exam grade may be dropped, in which case the weight of that exam will be shifted to the final exam (becoming 30 percent of the total grade). Make-up exams will generally not be offered. If one midterm exam is missed, the weight will automatically be shifted to the final. In addition to course material or problems from the midterms, the final exam may include questions pertaining to group presentations.

Homework: There will be several homework assignments, mostly problem-based but also involving short responses to readings. In the case of problems (but not reading responses), students may (and are encouraged to) work in groups to complete these assignments, but each student is responsible for turning in their own set of answers. Homework will account for 15 percent of the total grade. To allow for illness, car trouble, family issues, etc., the lowest two homework grades will be dropped.

Group Project: In small groups of 3 or 4, students will be responsible for applying game theoretic techniques to a real-world problem or situation in business, politics, or one’s own workplace. Each group will present the results of their analysis to the class. This presentation will be worth 10 percent of the total grade.

Participation and In-class Games: We will regularly carry out games, simulations or other activities in the classroom or computer lab in order to apply or test game theoretic predictions or strategies. Student attendance and participation is expected. 15 percent of the total grade will be based on participation and performance in these activities (10 percent based on participation and 5 percent based on performance). These games will typically (but not always) involve the use of Moblab, which will automatically keep data on performance throughout the semester. In addition to going towards your grade, the points earned from participation and performance in these games will translate into fake dollars (Husseybucks™), which will be used in actual auctions for real prizes that will take place the last day of the semester.

Final Course Grades

Final course grades are earned according to the following table. I reserve the right to lower (but not raise) these cutoffs.

<table>
<thead>
<tr>
<th>Range</th>
<th>Assigned Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>91-100</td>
<td>A</td>
</tr>
<tr>
<td>89-91</td>
<td>A-</td>
</tr>
</tbody>
</table>
Course Policies

E-mail:
All students are required to maintain and access their University of Memphis (@memphis.edu) email account. You will receive all official course correspondence at this email account. Any inability to receive incoming mail in a timely fashion (e.g., not regularly checking your email, having a “full mailbox” condition, etc.) is the student’s responsibility.

Attendance:
It is expected that students come to class. Regular attendance will be necessary for the in-class games to work properly. Attendance will be taken randomly on some class days, and this will enter into the participation grade. I encourage students to speak up when they do not understand something I have said in class, even if it is review. It is likely that if it was not clear to one student, others are in the dark as well. Your fellow students will appreciate your question.

Adding / Dropping:
If you have questions about adding or dropping classes, please refer to this page on the Registrar’s website.

Academic Integrity:
The University of Memphis has clear codes regarding cheating and classroom misconduct. If interested, you may refer to the Student Handbook section on academic misconduct for a discussion of these codes. Note that using a “Solutions Manual” is considered cheating. Should your professor have evidence that using a “Solutions Manual” has occurred, he/she may take steps as described on the campus’ Office of Student Conduct website. If you have any questions about academic integrity or plagiarism, you are strongly encouraged to review the Fogelman College’s Website on Academic Integrity.

Syllabus Changes:
The instructor reserves the right to make changes as necessary to this syllabus. If changes are necessitated during the term of the course, the instructor will immediately notify students of such changes both by individual email communication and posting both notification and nature of change(s) on the course bulletin board.

**Extra Credit:**

There will be no extra credit opportunities in this course.

**Student Services**

Please access the [FCBE Student Services](#) page for information about:

- Students with Disabilities
- Tutoring and other Academic Assistance
- Advising Services for Fogelman Students
- Technical Assistance

**Course Topics and Tentative Schedule**

The following is a preliminary course outline. Chapter and page numbers correspond to the 4\textsuperscript{th} edition of the textbook. Details may change as we progress through the course, and I will alert you to these changes as they occur. (* denotes homework due.)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Textbook</th>
<th>Art of Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>Introduction</td>
<td>Ch. 1 &amp; 2</td>
<td>Ch. 1</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Games with Sequential Moves</td>
<td>Ch. 3</td>
<td>Ch. 2, 11</td>
</tr>
<tr>
<td>27</td>
<td>Sequential Moves, cont.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb.</td>
<td>1* Simultaneous Moves, Pure Strategies</td>
<td>Ch. 4</td>
<td>Ch. 3-4</td>
</tr>
<tr>
<td>3</td>
<td>Pure Strategies, cont.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8*</td>
<td>Pure Strategies, cont.</td>
<td>Ch. 5</td>
<td></td>
</tr>
<tr>
<td>10*</td>
<td>Pure Strategies, cont., Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Midterm I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>No class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Sequential/Simultaneous Games: SPNE and Credibility</td>
<td>Ch. 6</td>
<td>Ch. 7</td>
</tr>
<tr>
<td>24*</td>
<td>Strategic Moves</td>
<td>Ch. 9</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Movie: Dr. Strangelove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Prisoners' Dilemma, Repeated Games</td>
<td>Ch. 10</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>2* Repeated Games, cont.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Mixed Strategies</td>
<td>Ch. 7</td>
<td>Ch. 5</td>
</tr>
<tr>
<td>16*</td>
<td>Mixed Strategies, cont.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Midterm II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Uncertainty and Information</td>
<td>Ch. 8</td>
<td>Ch. 6, 8</td>
</tr>
<tr>
<td>28</td>
<td>Uncertainty, cont.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30*</td>
<td>Principle-Agent Problem</td>
<td>pp. 557-571</td>
<td></td>
</tr>
</tbody>
</table>
April 4  Principle-Agent, cont.
6* Voting Strategy      Ch. 16  Ch. 10
11* Brinksmanship or bargaining, TBD
13  Review, Group project games
18  Midterm III
20  Auction Theory & Competitive Bidding  Ch. 17  Ch. 10
In-class group presentations
25  In-class group presentations
27  In-class auction for prizes

**Final Exam:** May 4\textsuperscript{th}, 1:00 – 3:00 p.m.