

Online ECON 4340/7340 – Introduction to Game Theory
Spring 2020
University of Missouri-Columbia
College of Arts and Science
Department of Economics

INSTRUCTOR

Oksana Loginova, loginovao@missouri.edu, office hours on Fridays from 10:30am to 11:30am CST, 325 Professional Building, in person and via Zoom

TEACHING ASSISTANT

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COURSE DESCRIPTION

What is common between a football coach, a military general, and a car manufacturer? They all act in environments where they need to choose the best possible action, given their resources, and expecting what their counterparts will do – what kind of offensive moves the other team is going to use; where the ambushes are likely to be located; and what kind of features other car manufacturers are going to put in their vehicles, and how their cars are going to be priced. All such strategic interactions are brought together under the umbrella of game theory.

This course is an introduction to the topic aimed to equip you with a set of analytical tools to understand the behavior of interacting decision-makers – countries, consumers, firms, politicians. The basic assumptions of game theory are that decision-makers pursue well-defined objectives and take into account their knowledge or expectations of other decision-makers' behavior. The course introduces the basic theory, emphasizing the concepts. A variety of applications will be discussed, mostly from economics, business, and political science.

The prerequisites for this course are Economics 3251 or Economics 4351.

LEARNING OBJECTIVES

After completing the entire course, you will be able to:

- Understand and explain fundamental concepts of non-cooperative game theory
- Apply solution concepts to examples of games, and to state and explain them precisely
- Identify strategic situations and present them as games

REQUIRED TEXT

- Avinash Dixit, Susan Skeath, and David H. Reiley, *Games of Strategy*, 4th edition.

Since this course is part of University of Missouri AutoAccess program, you already have access to the digital copy of the required text. You have a week from the start of the class to opt out of purchasing the ebook and receive a refund (\$53). However, keep in mind that a physical copy of the textbook, which you can purchase at retailers like Amazon, might cost you twice more. If you decide to stay with the AutoAccess ebook, there is an option for a print upgrade at the Mizzou Store (an additional \$44).

ONLINE COURSE ACCESS

You may access the course via <http://courses.missouri.edu>. Under course login, select Canvas and enter your PawPrint. If you are having any technical difficulties, please contact the Mizzou IT Help Desk via phone 573-882-5000 or e-mail helpdesk@missouri.edu.

TECHNICAL SKILLS REQUIRED

This class is a semester based online course. You are expected to have minimal technical skills such as using Canvas, scanning and uploading documents. Having reliable access to the Internet is necessary.

ATTENTION ONLINE MA STUDENTS: OFFICE HOURS VIA ZOOM

Since most of you cannot attend my or my TA's office hours in person, you can reach us via Zoom during the scheduled office hours (see the contact information). To learn more about Zoom, follow the link to <https://missouri.app.box.com/v/zoomstudentquickstart>.

ATTENTION UNDERGRADUATE STUDENTS: EXAMS IN MIDDLEBUSH HALL 12

While online MA students will take their exams through Canvas, undergraduate students must appear in person at Middlebush Hall 12 for their exams. Midterm 1 is on February 25, Midterm 2 on March 31, and the final on May 12 (see the weekly schedule). All three exams start at 5:00pm CST. Only calculators and your own notes from watching the videos/ reading the textbook are allowed on the exams.

ALL STUDENTS TAKE EXAMS AT THE SAME TIME

All students take the exams at the same time. As the schedule of the exams is set far ahead, please arrange with your professors in other classes and/or employers that you can take these exams at the specified times.

EXPECTATIONS

- **What to expect from a technology-enhanced course:** This course is designed to meet virtually. It is essential that you access the course site Monday through Friday to read announcements, participate in class discussions, view lectures, submit homework assignments and take exams.
- **What the instructor, the TA and your peers expect from you:** All general class correspondence, especially questions about course material, should be submitted to the Discussion Board. This will require a team effort, with respect and help for each other.
- **What you may expect from the instructor and the TA:** We will monitor and facilitate class discussions (Monday through Friday), respond to questions within 24 hours, provide timely feedback on homework assignments and exams, and help build a learning community.

KALTURA INFORMATION

This course uses Kaltura to deliver video recordings to you in a secure environment through Canvas. You may watch videos online, or download them for off-line viewing on your computer, smartphone, or media player. The Curators of the University of Missouri and your instructor jointly copyright these recordings. Posting them to another website, including YouTube, Facebook, BlipTV, or any other site without express, written permission may result in disciplinary action and possible civil prosecution. You may find Kaltura's statement on GDPR here: <https://corp.kaltura.com/blog/kalturas-compliance-gdpr/>.

WEEKLY SCHEDULE AND ASSIGNMENTS

Week	Unit	Tasks
1	Basic Ideas and Examples; How to Think about Strategic Games	<ol style="list-style-type: none"> 1. Familiarize yourself with the syllabus. 2. Read Chapter 1 from the textbook. Chapter 1 offers some simple examples of strategic games and strategic thinking. 3. Read Chapter 2. Chapter 2 classifies games along several key dimensions of different strategic matters or concepts.
2	Games with Sequential Moves	<ol style="list-style-type: none"> 1. Read Chapter 3. 2. Watch videos 3.1-3.6. 3. At this point you have all the information needed for Homework 1; start working on it immediately, as the due date is next Tuesday.
3	Simultaneous-Move Games: Discrete Strategies	<ol style="list-style-type: none"> 1. Submit Homework 1 by 5:00pm CST on Tuesday. 2. Start reading Chapter 4. 3. Watch videos 4.1-4.8. 4. You have all the information needed for Questions 1-4 of Homework 2.
4	Simultaneous-Move Games: Discrete Strategies (continued)	<ol style="list-style-type: none"> 1. Finish reading Chapter 4. 2. Watch videos 4.9-4.14. 3. You have all the information needed to complete Homework 2.
5	Simultaneous-Move Games: Continuous Strategies	<ol style="list-style-type: none"> 1. Submit Homework 2 by 5:00pm CST on Tuesday. 2. Read Chapter 5. 3. Watch videos 5.0-5.5. 4. You have all the information needed for Question 1 of Homework 3. 5. Watch videos M1.1-M1.3, a brief review for Midterm 1 that will be based on Chapters 3, 4 and 5.
6	Combining Sequential and Simultaneous Moves	<ol style="list-style-type: none"> 1. Take Midterm 1 on Tuesday, 5:00pm – 6:30pm CST. 2. Read Chapter 6. 3. Watch videos 6.1-6.9. 4. You have all the information needed to complete Homework 3.
7	Simultaneous-Move Games: Mixed Strategies	<ol style="list-style-type: none"> 1. Submit Homework 3 by 5:00pm CST on Tuesday. 2. Start reading Chapter 7. 3. Watch videos 7.1-7.7. 4. Start Homework 4 with Question 2.

8	Simultaneous-Move Games: Mixed Strategies (continued)	<ol style="list-style-type: none"> 1. Finish reading Chapter 7. 2. Watch videos 7.8-7.11. 3. You have all the information needed to complete Homework 4.
9	Uncertainty and Information	<ol style="list-style-type: none"> 1. Submit Homework 4 by 5:00pm CST on Tuesday. 2. Read Chapter 8. 3. Watch videos 8.1-8.5. 4. You have all the information needed for Questions 1 and 2 of Homework 5. 5. Watch videos M2.1-M2.3, a brief review for Midterm 2 that will be based on Chapters 6, 7 and 8.
10	Strategic Moves	<ol style="list-style-type: none"> 1. Take Midterm 2 on Tuesday, 5:00pm – 6:30pm CST. 2. Read Chapter 9. 3. Watch videos 9.1-9.6. 4. You have all the information needed to complete Homework 5.
11	The Prisoners' Dilemma and Repeated Games	<ol style="list-style-type: none"> 1. Submit Homework 5 by 5:00pm CST on Tuesday. 2. Read Chapter 10. 3. Watch videos 10.1-10.4. 4. You have all the information needed for Questions 1-3 of Homework 6.
12	Collective-Action Games	<ol style="list-style-type: none"> 1. Read Chapter 11. 2. Watch videos 11.1-11.9. 3. You have all the information needed to complete Homework 6.
13	Strategy and Voting	<ol style="list-style-type: none"> 1. Submit Homework 6 by 5:00pm CST on Tuesday. 2. Read Chapter 15. 3. Watch videos 15.1-15.9. 4. You have all the information needed for Questions 1-3 of Homework 7.
14	Bargaining	<ol style="list-style-type: none"> 1. Read Chapter 17. 2. Watch videos 17.1-17.5. 3. You have all the information needed to complete Homework 7.
15	Review for the Final Exam	<ol style="list-style-type: none"> 1. Submit Homework 7 by 5:00pm CST on Tuesday. 2. Watch videos F.1-F.5, a quick review for the final exam that will be based on Chapters 9, 10, 11, 15 and 17..
16	Final Exam	<ol style="list-style-type: none"> 1. Take the final on Tuesday, 5:00pm – 7:00pm CST.

ADVICE (HOW TO BE SUCCESSFUL)

- **Watch the videos:** If, for whatever reason, you have to choose between watching the videos and reading the textbook, you should go for the videos. There are a few videos that cover material that is not in the textbook, e.g. the minimax method for zero-sum games (video 4.8) or the linear city model (videos 5.4 & 5.5). Sometimes I use a different approach than the textbook. For example, I employ calculus in Chapter 5 (videos 5.0-5.5) and then later in Chapter 11 (videos 11.8 & 11.9), while the textbook avoids the use of derivatives to find an optimal value.
- **Read the textbook:** Turn to the textbook for more examples, or when you feel like things unravel too fast in the videos. Note that not all sections of the textbook chapters are relevant for the course. For example, you can safely skip Sections 2-4 in Chapter 5, Sections 1 and 6 in Chapter 8, Sections 3-6 in Chapter 10, Sections 4 and 5 in Chapter 11, Sections 3 and 5 in Chapter 15, and Sections 2, 4-7 in Chapter 17.
- **Practice, practice, practice!** The exercises in each chapter of the textbook are split into two sets, solved and unsolved. The solutions to the solved sets for all chapters can be obtained from the publisher's website. While I occasionally assign exercises from the unsolved sets, you can use exercises from the solved sets to practice.
- **Stay ahead of the schedule:** You do not need to wait until the due date to submit your homework assignment. Stay a few days or a week ahead of the schedule. This will allow more time to prepare for the exams.
- **Do not wait until the last day to start working on a homework:** All homework assignments are due on Tuesdays at 5:00pm CST. If you start working on a homework on the day it is due, you may (and will, on many occasions) run out of time – some of the material will be difficult, you may get distracted by other tasks and requirements, etc.
- **Never be late with electronic submissions:** All homework assignments (and exams for online MA students) are submitted electronically. Once the due date and time have passed – even by 1 second – the link to submit disappears.

EVALUATION AND GRADING

The course will be graded on the basis of the homework assignments (15%), the two midterm exams (25% each) and the final exam (35%). Letter grades will be mapped in the following way: A range is from 100% to 94.00%, A- from <94.00% to 90.00%, B+ from <90.00% to 87.00%, B from <87.00% to 84.00%, B- from <84.00% to 80.00%, C+ from <80.00% to 77.00%, C from <77.00% to 74.00%, C- from <74.00% to 70.00%, D+ from <70.00% to 67.00%, D from <67.00% to 64.00%, D- from <64.00% to 61.00%, F below that.

LATE WORK POLICY

Since this is an online course, no late assignments (homeworks and exams) will be accepted without University and Instructor approved documentation. If you have circumstances that affect your ability to complete an assignment, please contact me at least 3 days in advance of the due date.

NETIQUETTE

In an online classroom, our primary means of communication is written. The written language has many advantages: more opportunity for reasoned thought, more ability to go in-depth, and more time to think

through an issue before posting a comment on the Discussion Board forum. However, written communication also has certain disadvantages, such as lack of the face-to-face signaling that occurs through body language, intonation, pausing, facial expressions, and gestures. As a result, please be aware of the possibility of miscommunication and compose your comments in a positive, supportive, and constructive manner.

ACADEMIC INTEGRITY

Academic integrity is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards breaches of the academic integrity rules as extremely serious matters. Sanctions for such a breach may include academic sanctions from the instructor, including failing the course for any violation, to disciplinary sanctions ranging from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, collaboration, or any other form of cheating, consult the course instructor.

ADA STATEMENT

If you anticipate barriers related to the format of requirements of this course, or if you have emergency medical information to share with me, please let me know as soon as possible. If disability related accommodations are necessary (for example, a note taker, extended time on exams), please establish an accommodation plan with the MU Disability Center (<http://disabilitycenter.missouri.edu/>), S5 Memorial Union, 573-882-4696, and then notify me of your eligibility for reasonable accommodations.

STATEMENT ON INTELLECTUAL PLURALISM

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the departmental chair, the director of the Office of Students Rights and Responsibilities (<http://osrr.missouri.edu/>), or the MU Equity Office (<http://equity.missouri.edu/>). All students will have the opportunity to submit an anonymous evaluation of the instructor at the end of the course.

UNIVERSITY OF MISSOURI NOTICE OF NONDISCRIMINATION

The University of Missouri System is an Equal Opportunity/ Affirmative Action institution and is nondiscriminatory relative to race, religion, color, national origin, sex, sexual orientation, age, disability or status as a Vietnam-era veteran. Any person having inquiries concerning the University of Missouri's compliance with implementing Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, the Americans With Disabilities Act of 1990, or other civil rights laws should contact the Associate Vice Chancellor for Human Resource Services (<http://hrs.missouri.edu/>), 1095 Virginia Avenue, 573-882-4256, or the Assistant Secretary for Civil Rights, U.S. Department of Education.

GRIEVANCE POLICY

Information concerning student grade appeal procedures and non-academic grievances and appeals can be found at <http://registrar.missouri.edu/policies-procedures/grade-appeals.php>.