ECON 4361: Studies in Economics - Game Theory

Fall 2020 (August 24 – December 10)

Course Modality: Online Asynchronous Courses (OASYNC)

Instructor: Jean-Baptiste Tondji
E-mail: jeanbaptiste.tondji@utrgv.edu
Web page: Jean-Baptiste Tondji Google Website
Zoom live office hours: By appointment on MW 2:00 PM – 3:00 PM
Office Phone: (956)-665-2825
Office: ECOBE 218A

Course Modality Statement

Online Asynchronous Courses: These courses will be delivered fully online. There will be no designated class meeting time for real-time instructor/student interaction, which gives you the flexibility to engage with the course materials as best fits your daily schedule. Your learning will be guided by the digital presentation of the course content (e.g., recorded lectures, presentations, outlines, notes) and scheduled assignments. Your instructors will provide you with feedback on assigned work, communicate with you electronically, and be available to meet as defined on this syllabus.

Response Time, Material, and Rules

Generally, I will respond to emails within 48 hours of receiving them. If I plan to be away from my computer for more than a couple of days, I will let you know in advance. Please, for any technical questions, contact Blackboard Support. If you would like to make an appointment with me, email me. I will respond with a few possible times when I can meet you via Zoom. Please respond to this email (do not assume that I will leave those times open for you if you do not reply). All the class material is available through Blackboard Learn. Please make sure you thoroughly read the class rules information. In case you have any questions, do not hesitate to contact me.

Course Description

Game theory is the science of strategic interactions among decision-makers (like consumers, firms, politicians, and governments). It has applications to such diverse fields as biology, sociology, psychology, computer sciences, anthropology, and political science. Game Theory provides a set of tools that can assist economic agents (like firms, politicians, countries, family members, drivers in traffic, lawmakers, criminals, teachers, students) in the understanding of daily situations that involve conflicting interests. This course will introduce you to game theory with a strong emphasis on applications in economics. The main objective of the course is to expose students to some

1 I thank Prof. Gergely Ujhelyi for sharing his experience in teaching Game Theory at the University of Houston when I was preparing this syllabus.
fundamental concepts of game theory and how to exploit them to explain and understand economic, social, political, and financial phenomena. We will cover the following topics.

- Strategic games; Nash equilibrium
- Cournot's and Bertrand's models of duopoly
- Hotelling's model of electoral competition; the citizen-candidate model
- Mixed strategy Nash equilibrium, with applications
- Dominated strategies, iterated elimination of dominated strategies and common knowledge of rationality
- Strategic games with imperfect information; auctions
- Extensive games; subgame perfect equilibrium
- Ultimatum game, holdup game
- Repeated games; cooperation in a repeated duopoly
- The core; the Shapley value.

Prerequisites

Before taking this course, students should have passed the Principles of Macroeconomics course (ECON 2301) and Principles of Microeconomics (ECON 2302). Besides, you need to be very comfortable with algebra and know basic probability concepts (random variables, probability distribution, independent events, etc.). Prior knowledge of calculus is not required.

COVID-19 RESOURCES:

Please visit the UTRGV COVID-19 Website via the following link for the most up-to-date information and resources (https://www.utrgv.edu/coronavirus/index.htm). This includes information on self-screening questions, links to forms for travel and contact, etc.

Boilerplate language on self-screening and reporting is currently being developed.

Face Covering Protocol:

As part of the university’s ongoing COVID-19 mitigation efforts to maintain a healthy environment for all members of our campus community, anyone entering a campus building must wear a face covering that covers the mouth and nose. The covering must be worn in all hallways, public spaces, research labs, teaching/computer labs, libraries, classrooms, automobiles with a passenger, stairwells, elevators and common areas, as well as office spaces. In office spaces, when social distancing of 6 feet is possible and maintained, face coverings may be removed. Face coverings also are required in outdoor settings when safe social distancing and gathering practices are not possible.

Course Learning Objectives

Upon completion of the course, the student will be able to:

A. Define game theory and explain the components of the theory of rational choice.
B. Describe the characteristics and predictions of static games with and without perfect information.
C. Describe the characteristics and predictions of dynamic games with and without perfect information
D. Employ the predictions of models in game theory to explain the behavior of economic agents in markets.

Course Expectations

What should students do during the course?

- Read and review assigned readings.
- Work on Softchalk lessons.
- Work and submit your assignments
- Work and submit your initial posts on discussion boards and interact honestly with peers.
- Work and submit your essay.

What should the instructor expect from students during the course?

As a theoretical course, game theory is an analytical subject, and an ability to follow logical arguments is required to follow the material. The only way to master analytical material is to work through problems. The instructor will assign weekly tasks for each lesson or topic. To keep up with the course, students must complete those tasks.

❖ SoftChalk Lessons:
The instructor will assign SoftChalk lessons with embedded activities for each chapter (or topic) in each module. The instructor uses these activities for formative assessments. They allow students and instructors to keep track of the achievement of learning objectives. There will be no make-up for a missed lesson.

❖ Discussions:
Students will respond to discussion forum questions, and they will be evaluated according to the expectations given in the Discussion Forum Rubric. These discussions will allow students to discuss topics presented within the chapter and elaborate and share ideas of how they can apply new knowledge in a real-life setting.

❖ Assignments:
Students will submit written assignments, and they will be evaluated according to the score and rubric provided in the assignment's instructions. The homework helps you practice your theoretical skills in explaining economic concepts through practical examples.

❖ Essays:
In some modules, students will submit an essay, and they will be evaluated according to the expectations given in the Essay Rubric. This essay will allow students to demonstrate analytic skills on topics studied in the chapter. Students will also use the essay to illustrate how they can match theoretical knowledge to practical applications for modern societies. There will be no make-up for a missed essay. Students will receive zero points for missing to submit an essay by the due date.

College of Business and Entrepreneurship Learning Goals
### BBA Learning Goals

| Demonstrate foundational knowledge of functional area concepts and theories. | Yes | SoftChalk Lessons and Assignments |
| Demonstrate practical business communication skills | Yes | Discussion Boards and Essays |
| Apply sustainable practices (economic, social and ethical, and environmental) to business decision-making. | Yes | SoftChalk Lessons, Assignments, Discussion Boards, and Essays |
| Demonstrate an understanding of how globalization, including conditions on the US-Mexico border, shape effective business decision making. | Yes | SoftChalk Lessons, Assignments, Discussion Boards, and Essays |
| Apply quantitative analytical skills to business decision-making | Yes | SoftChalk Lessons, Assignments, Discussion Boards, and Essays |
| Demonstrate the ability to analyze business issues critically. | Yes | Assignments, Discussion Boards, and Essays |

### BBA and BA in Economics Major Learning Objectives

| BA and BBA in Economics Major Learning Objectives | Does this course contribute to the Department of Economics and Finance learning objective? | Assessments |
| Written communication skills | Yes | Assignments, Discussion Boards, and Essays |
| Analytical skills | Yes | SoftChalk Lessons, Assignments, Discussion Boards, and Essays |
| Current global awareness | Yes | SoftChalk Lessons, Assignments, Discussion Boards, and Essays |
| Knowledge of Economics | Yes | SoftChalk Lessons, Assignments, Discussion Boards, and Essays |

### Textbook, Technology, and/or Resources Material

**Textbook:**
Purchase Options: visit Amazon or Oxford University Press. Feel free to get the format of the textbook that suits your needs.

Course Technology
- On Blackboard Learn, review the information covered under Course Technology, either by clicking on the title above or the link on the left-hand menu. This will show you the technical requirements, expectations, Blackboard Orientation, accessibility, and privacy statement links and how to contact Blackboard Support.
- Note: The learning materials in this course include prerecorded Panopto micro-lectures, videos, and audios. I will also be available for Zoom live office hours. For that reason, hardware such as speakers, a Webcam, a microphone, a headset, or any additional plugins that enhance the capabilities of your electronic device (laptop, desktop, Ipad, ChromeBook, etcetera) might be useful.

Grading Policy

Grading structure

<table>
<thead>
<tr>
<th>Assessments</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Questionnaires (2)</td>
<td>10 points</td>
</tr>
<tr>
<td>SoftChalk Lessons (10)</td>
<td>100 points</td>
</tr>
<tr>
<td>Discussions (11)</td>
<td>105 points</td>
</tr>
<tr>
<td>Assignments (10)</td>
<td>100 points</td>
</tr>
<tr>
<td>Essays (2)</td>
<td>50 points</td>
</tr>
</tbody>
</table>

Grading system
Once you divide the points you obtained by 365 and then multiply by 100, the cutoffs for the A-F grading system are given by:

<table>
<thead>
<tr>
<th>Percentage range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90.00 – 100.00</td>
<td>A</td>
</tr>
<tr>
<td>80.00 – 89.99</td>
<td>B</td>
</tr>
<tr>
<td>70 – 79.99</td>
<td>C</td>
</tr>
<tr>
<td>60 – 69.99</td>
<td>D</td>
</tr>
<tr>
<td>Less than 60</td>
<td>F</td>
</tr>
</tbody>
</table>

Blackboard Support

If you need assistance with course technology at any time, please contact the Center for Online Learning and Teaching Technology (COLTT).

<table>
<thead>
<tr>
<th>Campus</th>
<th>Location</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brownsville</td>
<td>Casa Bella (BCASA) 613</td>
<td>956-882-6792</td>
</tr>
<tr>
<td>Edinburg</td>
<td>Education Complex (EEDUC) 2.202</td>
<td>956-665-5327</td>
</tr>
</tbody>
</table>

Toll Free: 1-866-654-4555
Office Hours: Monday - Friday, 7:30 a.m. - 6:00 p.m.
Support Tickets: Submit a Support Case via our Ask COLTT Portal

**24/7 Blackboard Support**
Need Blackboard assistance after hours? You can call our main office numbers, 956-882-6792 or 956-665-5327, to speak with a support representative.

**ATTENDANCE**

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; have been provided such an accommodation by Student Accessibility Services (SAS); for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**Makeup Work**

Students must have a valid **University excuse** in order to take a make-up assessment. You need to schedule your make-up assessment at the time you first know that you will not be taking the assessment. Otherwise, the student will receive zero points if he or she misses the assessment.

**Computer and Digital Literacy Skills**

**Computer Skills**
To be successful in this course, you are expected to be proficient with the following:

- Using Blackboard
- Using and sending an email with attachments
- Creating and submitting files in commonly used word processing program formats
- Copying and pasting
- Downloading and installing software

If you are not familiar with Blackboard, please visit the Blackboard Orientation course.

**Digital Literacy Skills**

Digital literacy involves your ability to find and consume, create, and communicate using digital content in a responsible and informed way. In this course you are expected to:

- Use the [UTRGV library database](#) and online search tools (I.e., [Google Scholar](#)) for academic purposes
  - [Library Database Video Tutorial](#)
  - [Google Scholar Video Tutorial](#)
- Properly cite sources in APA Format
  - [Purdue OWL Citation Guides](#) (APA, MLA, Chicago)
  - [APA Citation Video Tutorial](#)
- Properly paraphrase work
  - To Paraphrase means formulating someone else’s ideas in your own words. To paraphrase a source, you have to rewrite a passage without changing the meaning of the original text and cite the source you used.
Know what plagiarism is and avoid plagiarism.
- Plagiarism means to steal and pass off someone else's ideas or words as your own.
- It also means using another's work without crediting them as your source.
- Trying to present someone else's ideas/work as your original work

Netiquette Guidelines

Netiquette is internet etiquette or a set of expectations that describe appropriate behaviors when interacting online. It is essential to understand that you will be held to the exact same standards of students taking a face-to-face course. In fact, for 100% online courses, your online classroom behavior may be the only interaction you have with your faculty and classmates, therefore making your netiquette even more critical. Remember, you only get to make a first impression once, irrespective of the course delivery method.

Be courteous.
You only get one chance for an online first impression. Make it count. Do not say or do anything in an online classroom that you would not do in a face-to-face class. This includes not "YELLING" (typing in all caps), not "flaming" (attacking someone, such as insults and name-calling), or not dominating the Discussion.

Be a good classmate.
Remember your role as a student. Always follow your instructor's directions. Be authentic and collaborative with fellow students. Be aware of cyberbullying and make every attempt to eliminate it. Appreciate the diversity and different communication styles of your peers. Remember, since this class is online, you may have classmates from all over the world.

Be professional.
Proofread your writing for spelling, grammar, and punctuation to prevent miscommunication. Avoid slang, sarcasm, or emotionally charged writing, as tone can be challenging to translate online. Profanity and offensive language will not be tolerated. Do not use abbreviations (2mor0, 2T, B@U) or emoticons in your online class unless your professor approves and supports such writing styles.

When sending an email:
When using and sending an email, please keep the following in mind:
- Use your UTRGV email (this helps instructor identify who you are)
- In the subject line include the Course Number you are enrolled in + Short Summary (Ex. ECON-3352- Assignment 1 Problem 1)

ACADEMIC INTEGRITY

Members of the UTRGV community uphold the Vaquero Honor Code’s shared values of honesty, integrity and mutual respect in our interactions and relationships. In this regard, academic integrity is fundamental in our actions, as any act of dishonesty conflicts as much with academic achievement as with the values of honesty and integrity. Violations of academic integrity include, but are not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the
attempt to commit such acts (Board of Regents Rules and Regulations, STU 02-100, and UTRGV Academic Integrity Guidelines). All violations of Academic Integrity will be reported to Student Rights and Responsibilities through Vaqueros Report It.

UTRGV Policy Statements

Mandatory Course Evaluation
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account. You will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available from November 13 – December 2, 2020.

Students with Disabilities
Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive reasonable academic accommodations should contact Student Accessibility Services (SAS) for additional information. In order for accommodation requests to be considered for approval, the student must apply using the mySAS portal located at www.utrgv.edu/mySAS and is responsible for providing sufficient documentation of the disability to SAS. Students are required to participate in an interactive discussion, or an intake appointment, with SAS staff. Accommodations may be requested at any time but are not retroactive, meaning they are valid once approved by SAS. Please contact SAS early in the semester/module for guidance. Students who experience a broken bone, severe injury, or undergo surgery may also be eligible for temporary accommodations.

Pregnancy, Pregnancy-related, and Parenting Accommodations
Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to apply to Student Accessibility Services using the following link: Pregnancy Accommodations Request Form https://www.utrgv.edu/pregnancy.

Student Accessibility Services:
Brownsville Campus: Student Accessibility Services is located in 1.107 in the Music and Learning Center building (BMSLC) and can be contacted by phone at (956) 882-7374 or via email at ability@utrgv.edu.

Edinburg Campus: Student Accessibility Services is located in 108 University Center (EUCTR) and can be contacted by phone at (956) 665-7005 or via email at ability@utrgv.edu.

Sexual Misconduct and Mandatory Reporting
In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (OIED@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity,
civility, and mutual respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at (956) 665-8287, (956) 882-8282, or OVAVP@utrgv.edu.

Course Drops
According to UTRGV policy, students may drop any class without penalty, earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the course should be aware of the "3-peat rule" and the "6-drop" rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

Student Services
Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Student Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor’s office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, counseling services, critical thinking, study skills, degree planning, and student employment. In addition, services such as the Food Pantry are also provided. Locations are listed below.

<table>
<thead>
<tr>
<th>Center Name</th>
<th>Brownsville Campus</th>
<th>Edinburg Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advising Center</td>
<td>BMAIN 1.400</td>
<td>ESWKH 101A</td>
</tr>
<tr>
<td><a href="mailto:AcademicAdvising@utrgv.edu">AcademicAdvising@utrgv.edu</a></td>
<td>(956) 665-7120</td>
<td>(956) 665-7120</td>
</tr>
<tr>
<td>Career Center</td>
<td>BINAB 1.105</td>
<td>ESSBL 2.101</td>
</tr>
<tr>
<td><a href="mailto:CareerCenter@utrgv.edu">CareerCenter@utrgv.edu</a></td>
<td>(956) 882-5627</td>
<td>(956) 665-2243</td>
</tr>
<tr>
<td>Counseling Center</td>
<td>BSTUN 2.10</td>
<td>EUCTR 109</td>
</tr>
<tr>
<td><a href="mailto:Counseling@utrgv.edu">Counseling@utrgv.edu</a></td>
<td>(956) 882-3897</td>
<td>(956) 665-2574</td>
</tr>
<tr>
<td>Counseling and Related Services List</td>
<td>BCAVL 101 &amp; 102</td>
<td>EUCTR 114</td>
</tr>
<tr>
<td>Food Pantry</td>
<td>(956) 665-7126</td>
<td>(956) 665-3663</td>
</tr>
<tr>
<td><a href="mailto:FoodPantry@utrgv.edu">FoodPantry@utrgv.edu</a></td>
<td></td>
<td></td>
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<tr>
<td>Learning Center</td>
<td>BMSLC 2.118</td>
<td>ELCTR 100</td>
</tr>
<tr>
<td><a href="mailto:LearningCenter@utrgv.edu">LearningCenter@utrgv.edu</a></td>
<td>(956) 882-8208</td>
<td>(956) 665-2585</td>
</tr>
<tr>
<td>Writing Center</td>
<td>BUBLB 3.206</td>
<td>ESTAC 3.119</td>
</tr>
<tr>
<td><a href="mailto:WC@utrgv.edu">WC@utrgv.edu</a></td>
<td>(956) 882-7065</td>
<td>(956) 665-2538</td>
</tr>
</tbody>
</table>
Note

- The UTRGV disability accommodation, mandatory course evaluation statement, and sexual misconduct statement are also accessible through UTRGV Institutional Policies.
- The UTRGV student resources, including technical, academic, and student support services, are also accessible through UTRGV Academic Support Services.

Tentative Course Outline (readings in parentheses)

Below is the tentative outline for the semester. In module 1, the instructor provides the general structure of each chapter. The organization of Chapter 1 in Blackboard Learn gives students an overview of different types of learning activities that they will likely find in each module and sections. IGT is the abbreviation of the textbook.

Module 1. Introduction (August 24 – August 30)

Week 1 (August 24 – August 30)
- What is game theory? (IGT 1.1)
- Rational choice (IGT 1.2)

Module 2. Static games with perfect information (August 31 – October 4)

Week 2 (August 31 – September 6)
2.1 Dominant strategies
- Normal form representation; Dominance and iterated elimination (IGT 2.1-2.5, 2.9)
- Application: Auctions (IGT 3.5)

Weeks 3&4 (September 7 – September 20)
2.2 Nash equilibrium and applications
- Basic concepts (IGT 2.6-2.8)
- Coordination problems and policy Public goods
- Oligopolies (IGT 3.1-3.3)
- Electoral competition (IGT 3.3)
- Law and economics (IGT 3.6)
- Extension: mixed strategies (IGT 4.2-4.4)

Weeks 5 & 6 (September 21 – October 4)
2.3 Coalitional games and the core
- Coalitional games (IGT 8.1)
- The core (IGT 8.2, 8.6)
- The Shapley value

Module 3. Dynamic games with perfect information (October 5 – November 8)

Week 7 (October 5 – October 11)
3.1 Basic theory
- Extensive form representation; Backward induction (IGT 5)

Week 8 (October 12 – October 18)
3.2 Illustrations
- Ultimatum games and the holdup problem (IGT 6.1)
- Dynamic oligopolies (IGT 6.2)
- Vote-buying (IGT 6.3)
Week 9 (October 19 – October 25)
3.3 Extensions: Theory and Illustrations
- Theory: Subgame Perfect Nash Equilibrium (IGT 7.1)
- Illustrations: Entry and market size (IGT 7.2)

Weeks 10 & 11 (October 26 – November 8)
3.4 Repeated games
- Basic concepts (IGT 14.1-14.3)
- Finite repetitions (IGT 14.4)
- Infinite prisoner's dilemma (IGT 14.5-14.8)
- Application: collusion in oligopolies

Module 4. Games with imperfect information (November 9 – December 10)

Weeks 11 & 12 (November 9 – November 22)
4.1 Static games
- Basic concepts (IGT 9.1-9.2)
- Application: the value of information (IGT 9.3)
- Application: Cournot competition with asymmetric information (IGT 9.4)

Weeks 13 & 14 (November 23 – December 6)
4.2 Dynamic games
- Basic concepts (IGT 10.4)
- Signaling games (IGT 10.5)
- Application: education as a signal

Week 15 (December 7 – December 10)
- Final Exams

Important University Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>August 21</td>
<td>Last day to withdraw for a 100% refund</td>
</tr>
<tr>
<td>August 24</td>
<td>Fall classes begin</td>
</tr>
<tr>
<td>August 27</td>
<td>Last day to add a class or register for Fall classes</td>
</tr>
<tr>
<td>September 9</td>
<td>Census day (last day to drop without it appearing on the transcript)</td>
</tr>
<tr>
<td>September 14</td>
<td>Last day to withdraw and receive a 50% refund</td>
</tr>
<tr>
<td>November 11</td>
<td>Last day to drop (DR grade) a class or withdraw (grade of W)</td>
</tr>
<tr>
<td>December 3</td>
<td>Study day (no classes)</td>
</tr>
<tr>
<td>December 10 -14</td>
<td>Final Exams (for face-to-face classes)</td>
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</tbody>
</table>