

## SYLLABUS

Course: ECON 411. Game Theory. 3 Credits.

### Course Description:

This is an introductory course to non-cooperative game theory. We will study strategic behavior in different environments (static vs dynamic, under certainty vs under uncertainty). The emphasis will fall on economic applications: oligopoly behavior; bargaining; etc...

Target audience: This course is aimed at anyone who completed ECON 410.

Requisites: Prerequisite, ECON 410 with a grade of C or better.

Grading status: Letter grade.

### Instructor:

Sérgio O. Parreiras  
Gardner Hall, 200B  
sergiop@unc.edu,

### Class Schedule:

TuTh 12:30 pm - 1:45 pm  
Gardner Hall, Rm 1 309

### Office Hours (OH):

over ZOOM on Mon: 1 pm–2 pm,  
Wed: 1 pm–2 pm,  
by Sakai appt.

### Communication:

The Sakai website is our primary main of communication. All assignments, readings, grades, podcast links, other resources, etc... will be posted on Sakai. Please, use Sakai ¿ Messages instead of regular email; Sakai ¿ Sign-up to schedule a meeting. The sign-up opens seven days before and closes 24 hours before respective OH. Do not hesitate to send a Sakai message to schedule meetings **outside** regular OH if your schedule conflicts with the regular OH.

Prerequisites: Requisites: Prerequisite, ECON 410 with a grade of C or better.

### Suggested textbook:

Osborne, Martin J. (2004) *An Introduction to Game Theory*, Oxford University Press. I also use this textbook in ECON 511. Although **not required**, it provides a terrific companion to our course and, it is a great reference source.

### Learning Objectives:

The course main goal is to provide tools to enable you to: 1) build models of strategic behavior, 2) identify their (built-in) limitations and 3) think about how to apply them to real-life problems;

### Software:

Mathematica, which can be ordered free of any charges at <https://software.unc.edu>.

No prior knowledge of Mathematica is required for one to succeed in this course.

### Evaluation:

Course grade weights: midterms (40%), problem sets & quizzes (20%), final exam (35%), active participation (5%).

Exam dates:

September 13th (first midterm), October 18th (second midterm), Final examination (December 2nd).

Class environment:

During this course, we may employ additional material from podcasts, video, or literature to discuss behavioral economics related issues. Sometimes, you may find the political or religious views; or the profanity contained in the additional material offensive or objectionable and, you may feel uncomfortable. I will not endorse or advocate any particular political views but as part of your university education, it is important you engage in critical thinking and also respect different opinions expressed by your classmates. Our classroom will be an inclusive environment. Your participation is critical for the success of this course. You will be expected to read the assigned readings and, be prepared to discuss them in the classroom.

## POLICIES AND PROCEDURES

**Syllabus Changes:** I reserve the right to make changes to the syllabus including project due dates and test dates. These changes will be announced as early as possible.

**Optional Mask Use Statement:** UNC-Chapel Hill is committed to the well-being of our community – not just physically, but emotionally. The indoor mask requirement was lifted for most of campus on March 7, 2022. If you feel more comfortable wearing a mask, you are free to do so. There are many reasons why a person may decide to continue to wear a mask, and we respect that choice.

**Communication:** Please, use Sakai to send me messages instead of regular email. All assignments should be submitted on Sakai. You will receive notifications for those classes in which Mathematica is required.

**Honor Code:** All students are expected to follow the guidelines of the UNC honor code. In particular, students are expected to refrain from “lying, cheating, or stealing” in the academic context. If you are unsure about which actions violate the honor code, please see me or consult <https://catalog.unc.edu/policies-procedures/honor-code/>.

**Exams and grades:**

If you are eligible to take exams with Accessibility Resources and Service. Please schedule your exam using their hub, <https://ars.unc.edu/>, and please notify me as soon as possible.

Any final-exam rescheduling request, for those with more than three final exams within a 24 hours period, must be received no later than our first midterm.

Exam grades are converted into scores (“curved”) accordingly to the formula: original grade plus 100 minus the maximum between the top class grade and 50. Assignments or problem sets are not “curved”. The final course grade is computed accordingly to the following scheme:

letter grade	minimum score
A	95
A-	90
B+	87
B	83
B-	80

letter grade	minimum score
C+	77
C	73
C-	70
D+	67
D	63

**Attendance Policy:** University Policy: As stated in the University’s Class Attendance Policy, no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences: 1.) Authorized University activities; 2) Disability/religious observance/pregnancy, as required by law and approved by Accessibility Resources and Service and/or the Equal Opportunity and Compliance Office (EOC). 3) Significant health condition and/or personal/family emergency as approved by the Office of the Dean of Students, Gender Violence Service Coordinators, and/or the Equal Opportunity and Compliance Office (EOC).

**Counseling and Psychological Services:** UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The Heels Care Network website is a place to access the many mental resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

**Title IX Resources:** Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/>. Please contact the University's Title IX Coordinator (Elizabeth Hall, [titleixcoordinator@unc.edu](mailto:titleixcoordinator@unc.edu)), Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu](mailto:reportandresponse@unc.edu)), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators ([gvsoc@unc.edu](mailto:gvsoc@unc.edu); confidential) to discuss your specific needs. Additional resources are available at [safe.unc.edu](http://safe.unc.edu).

**Policy on Non-Discrimination:** The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's Policy Statement on Non-Discrimination offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered and that equitable and consistent standards of conduct and performance are applied. If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (see contact info at [safe.unc.edu](http://safe.unc.edu)) or the Equal Opportunity and Compliance Office, or online to the EOC at <https://eoc.unc.edu/report-an-incident/>.

**Diversity Statement:** I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve. I appreciate suggestions.

**Undergraduate Testing Center:** The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit <http://testingcenter.web.unc.edu/>.

**Grade Appeal Process :** If you feel you have been awarded an incorrect grade, please discuss with me. If we cannot resolve the issue, you may talk to our departmental director of undergraduate studies or appeal the grade through a formal university process based on arithmetic/clerical error, arbitrariness, discrimination, harassment, or personal malice. To learn more, go to the Academic Advising Program website.

## TENTATIVE COVERAGE

	Tuesday	Thursday
Week 1	8/16: Syllabus and strategic problems.	8/17: Strategic games: definition and examples. PS 00 due.
Week 2	8/23: Nash equilibrium.	8/25: Best-response functions, PS 01 due.
Week 3	8/30: Oligopoly games	9/1: Efficiency and Nash eq., public good games, PS 02 due.
Week 4	9/6 Well-being Day no classes	9/8: Dominated strategies and iterative deletion.
Week 5	9/13: Midterm 1	9/15: Mixed strategies, PS 03 due.
Week 6	9/20: Mixed strategy Nash equilibrium	9/22: Applications of mixed strategy eq., PS 04 due.
Week 7	9/27: Extensive Games	9/29: Subgame Perfect Nash eq., PS 05 due.

	Tuesday	Thursday	Friday
Week 8	10/4: Extensive Games with simultaneous moves.	10/6: Repeated Games, PS 06 due.	
Week 9	10/11: Repeated Games	10/13: Applications of extensive games, PS 07 due.	
Week 10	10/18: Midterm 2	10/20 Fall Break <b>no classes</b>	
Week 11	10/25: Bayesian games and Bayesian Nash eq.	10/27: Applications of Bayesian games, PS 08 due.	
Week 12	11/1: Games of incomplete info.	11/3: Perfect Bayesian eq., PS 09 due.	
Week 13	11/8: Signaling games	11/10: Mechanism design, PS 10 due.	
Week 14	11/15: Testing game theory	11/17: TBA	
Week 15	11/22: TBA	11/25 Thanksgiving Recess <b>no classes</b>	
Week 16	11/29:TBA, last class		
			12/2, noon <b>Final Exam</b>