

Economics 421 (M001, M002, M003): Game Theory and Economic Strategy

Spring 2023
Professor Buzard

This course examines situations in which each agent's behavior affects the well-being of the other agents. Game theory is a technical framework for rigorously analyzing decision-making in such settings. We will focus on human interaction and assume that people behave in a rational, deliberate manner. In addition to exploring theory in the abstract, we will consider a variety of applications from economics, business, political science, sports and everyday life.

Schedule: M001, MW 12:45 – 2:05 p.m. in Hall of Languages, Room 205
M002, MW 2:15 – 3:35 p.m. in Maxwell Hall, Room 108
M003, W 5:15 – 6:35 p.m. in Falk, Room 175 (evaluations, review, some office hours)

Class Website: All materials and announcements will be posted on **Blackboard**, <https://blackboard.syr.edu>. Announcements will also be pushed to SU email accounts. It is each student's responsibility to check daily for announcements.

Required Materials:

- Book (on reserve at Bird Library): Watson, J., *Strategy: An Introduction to Game Theory* (Norton) 3rd Edition, 2013.
- A PointSolutions account and subscription is necessary to receive credit for in-class participation. See "Book and PointSolutions information" under *Course Overview* tab on Blackboard.

Office Hours and Contact Information:

- Professor Buzard (kbuzard@syr.edu, 315-443-4079): Mondays 10:00 – 11:00 am in Eggers 131; Wednesdays 5:15-6:15pm in Falk, Room 175; or by appointment at kbuzard@syr.edu.
- Teaching Assistant: Jorge Valdebenito (javaldeb@syr.edu): Tuesdays 4:00 – 6:00 pm, Eggers 049

Prerequisites: The prerequisites for this course are Intermediate Microeconomics (ECN 301 or 311) and Calculus (MAT 284, 285, 295 or 296). You will need to already be comfortable with partial differentiation or be able to learn it quickly. Appendix A of the Watson text is a good gauge of the math you will need. There will be two math quizzes during the semester; for each quiz, you must keep re-taking a version until you earn a score of at least 80% in order to stay in good standing to earn participation points.

Course Objectives: This course centers learning around students. Working most often in small teams, we will emphasize reflection and discussion of course material and how it relates to applications to help each other understand issues in which you are interested. While one goal is to learn important tools of strategic analysis, most important is learning how to *think* about situations you might encounter in the future. By the end of the semester, members of the ECN 421 learning community will be able to:

1. Distinguish a strategic situation from an individual's decision problem;
2. Describe a given strategic situation and mathematically represent it so that it can be analyzed;
3. Identify, precisely state, justify and apply the appropriate solution concept (i.e. solve the game) for a given strategic situation, including well-known games;
4. Recognize and explain the problems that arise from strategic interactions (i.e. strategic tensions)
5. Use Game Theory to understand and explain strategic interactions and the outcomes to which they lead, both within and beyond the classroom.

I believe that the best use of class time is to work together on the most challenging questions with the guidance of your instructors, so students are asked to read AND WATCH the basic materials ahead of class and are **quizzed before each class** to ensure everyone is prepared. These quizzes will be on Blackboard. We will use the **PointSolutions app** for individual and team responses to discussion

questions posed throughout each class period (these responses are graded for participation only and not correctness so that there is no anxiety about grades as we wrestle with new ideas). Short periods of lecture will be interspersed with individual reflection and team discussion to move the conversation forward and introduce key new concepts and challenges. In this way, it is my hope that we do the “heavy lifting” of learning in class at a relatively even pace, with little need for cramming. The learning community that we will create together will become the defining feature of the course.

In addition to the textbook, I will periodically introduce articles, videos, games and other outside materials from various sources. I’ll make clear which materials are required for exam purposes.

Chapter Evaluations (50% of grade): About ten individual, in-person evaluations (longer than a quiz; shorter than an exam) will take place during the **5:15pm sessions on Wednesdays**. Each evaluation will cover one to three chapters. The lowest score will be dropped in order to accommodate absences.

Problem Sets: Problem sets will be provided for practice but will not be graded. You may submit work either in written form or verbally during office hours to get feedback.

Course Objectives Mastery (25% of grade): You have three choices to show that you have mastered the five course objectives listed on the previous page. The default is an individual, in-person exam that takes place during the final exam period. There are two alternatives:

- A. Five short group evaluations that take place during the 5:15 sessions on Wednesdays. I will assign groups of 3-4 for these closed-book evaluations. We will do a practice evaluation in class on February 1. The deadline for enrollment in this track will be soon after that.
- B. A group project that models a strategic situation of your choosing. To enroll in the group project track, your group of 3-4 members must have a project topic approved by February 8. To gain approval, your group will pitch your project to Professor Buzard in office hours as early as January 18. Project topics are first-come, first-served and may not repeat a project topic from the past two years (list posted on Blackboard).

Reading Quizzes (10% of grade) and **Class Participation** (15% of grade): The score for class participation and reading quizzes (both take place for each class day of the semester) is calculated from 85% of the total points in each category. That is, you only need to get 85% of the quiz questions correct to get the full 10% of the grade and answer 85% of the discussion questions to get the 15% for class participation. This is to allow for family emergencies, illness, job interviews, technology problems and similar circumstances since there is no way to make up these portions of the course. No other allowances will be made; this policy substitutes for ‘excused’ absences.

To receive a team assignment and be eligible to earn **participation points**, you must:

1. submit a 400-word synopsis (Blackboard/Turnitin) of Jan. 18’s class material pertaining to the course design and commitments to the learning community by Jan. 20 at 11:59pm;
2. complete the Syllabus Quiz (Blackboard) by Jan. 20 at 11:59pm;
 - If you have not been added to Blackboard by midnight on Jan. 19, the deadlines for items 1 and 2 are extended to 11:59pm the day after Blackboard access is granted.
3. complete the math pre-test by Thursday, Jan. 26 if enrolled after class on Monday, Jan. 23;
4. submit the First Class Survey (Google Form) by Thursday, Jan. 26 at 11:59pm;
5. create a PointSolutions account and register a subscription (Blackboard/PointSolutions) by Thursday, Jan. 26 at 11:59 pm.
 - Because poor attendance causes difficulties for small team dynamics, I reserve the right to withdraw a team assignment from any student whose attendance falls below 70% of class sessions. If this action must be taken, that student **forfeits** all future class participation points. In addition, no class participation points can be earned as long as a student’s attendance is below the 70% threshold, regardless of team assignment status.

Grading: Grades are assigned according to the following percentages: A: 93-100%, B: 85-92%, C: 75-84%, D: 65-74%, F: below 65% (plus/minuses awarded within those ranges) unless the curve that awards the following percentages of letter grades (plus/minuses again awarded) would increase your grade:

Grade	Percent of Students Receiving that Grade (Approximate)
A	20-30
B	25-35
C	25-35
D & F	5-10

Course Policies:

1. SU's religious observances policy (http://supolicies.syr.edu/emp_ben/religious_observance.htm) recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes. An online notification process is available through MySlice/Student Services/Enrollment/My Religious Observances from the first day of class until the end of the second week.

2. If you believe that you need accommodations for a disability, please contact the Center for Disability Resources (CDR), located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. CDR is responsible for coordinating disability-related accommodations and will issue students with documented Disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact CDR as soon as possible.

3. SU's Academic Integrity Policy defines expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations. For ECN 421, this includes no collaboration allowed on individual evaluations or Blackboard quizzes; a prohibition against submitting answers using another student's PointSolutions account or a student's own account when not participating in group activities. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments (which requires that work be generated by the human(s) who submit it), and any verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. For more information, see <http://academicintegrity.syr.edu>. The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level.

4. Some work in this class will be submitted via the plagiarism detection and prevention system Turnitin. Turnitin compares submitted documents against documents on the Internet and against student papers submitted to Turnitin at SU and at other colleges and universities. I will take your knowledge of the subject matter of this course and your writing level and style into account in interpreting the originality report. Keep in mind that all papers you submit for this class will become part of the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers.

5. As stated in the University's Academic Rules and Regulations, student work prepared for this course in

any media may be used for educational purposes. You grant permission to have your work used in this manner by registering for, and by continuing to be enrolled in, this course. After you have completed this course, any further use of your work will either be rendered anonymous by removing all your personal identification or your written permission will be secured. If you object in any way, please send me an email no later than the second week of class at kbuzard@syr.edu.

6. Students have one week from the day on which an evaluation is graded to request a re-grade. This request must be made by email. If a student submits his/her work for re-grading, the student's entire submission will be re-graded by the professor (with no guarantee of a higher total score).

7. If you arrive late to an evaluation, you will be allowed to take it in the time that remains *as long as no one has submitted his/her evaluation*.

8. The use of electronic devices is permitted only to access PointSolutions, the textbook, and note-taking applications for ECN 421 course material. Other use of electronic devices is not allowed and will be enforced by the deduction of participation points. The wearing of headphones during class is strictly prohibited. No devices of any kind are allowed during in-class evaluations or quizzes.

9. English is the language of instruction and interaction in class at all times. As it is the sole language that is shared by all students in the learning community, participation points will be deducted for using a language other than English during class time.

10. You may not post any course materials, including quizzes, exams, problem sets and/or their answers on the internet or any other media. You may not share any of these materials in any way without my express written consent except for the explicit and time-limited purpose of studying with your classmates this semester.

Course Outline

<u>Topic</u>	<u>Chapters in the textbook</u>
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A. Representing Games

Extensive form, strategies, normal form	1 – 3
Beliefs/mixed strategies, assumptions	4 – 5

II. Analysis of Static Settings

Best response, rationalizability, applications	6 – 8
Equilibrium, applications	9 – 10
Mixed strategy equilibrium	11

III. Analysis of Dynamic Settings

Extensive form, backward induction, SPE	14 – 15
Examples and applications	16

IV. Information

Random events and incomplete information	24
Bayesian equilibrium, applications	26 – 27
PBE, applications	28 – 29