
**Economics 265: Game Theory
and Economic Applications**

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Carleton College
Northfield, MN 55057

Meets in Willis 205, 2a block
(MW 9:50 – 11, F 9:40 – 10:40)

Office Hours: 11 – 11:30 MW,
3:15 – 4:30 MTh, or by appointment
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Course Overview:

Game theory is a tool for analyzing strategic interactions—situations in which the results of one person’s actions depend on another person’s actions. In order to use game theory to make predictions about behavior, we will need to devote time to studying it as a subject in itself, with explicit terminology and rules. As you learn this methodology, you will have a chance to apply game theoretic techniques to a variety of situations. As the title of this course implies, the emphasis will be on economic applications, such as behavior in oligopolies, but we will also use examples from other academic subjects and everyday life.

Text:

The text for this class is Strategy: An Introduction to Game Theory (2nd Edition) by Joel Watson. This book is full of good examples and I think it’s quite engaging for a textbook, but you should be warned that it is mathematically rigorous. I will use class time to explain seemingly difficult definitions in simple terms, but you must be prepared to “read math.” You will also be assigned additional reading from other sources.

Assignments and Grading:

In my experience, the only way to get good at solving game theoretic problems is to engage in a lot of practice, and the concepts you read about in the textbook will make much more sense once you start solving problems. Therefore, you will have assignments due each day of class. The main purpose is to keep you engaged with the material and make sure you are not falling behind in the class. This will also help you to recognize the areas you have trouble with so you can ask questions in class. I will expect you to turn in these homework assignments each class, but I will only grade a few randomly selected problems throughout the term. This will count toward 5% of your final grade, but an adequate level of work on all assignments will help your exam grade. I will also assign several essay-based or longer-term assignments throughout the term, which will count toward another 10% of your grade.

The bulk of your grade will come from 3 in-class tests. If you turn in all of the regular homework assignments on time and show adequate effort on each, your exam grade will be weighted such that the exam on which you perform best will count toward 35% of your final grade and the other two will be worth 25% each. If you fail to turn in all assignments or show a lack of effort on some, the three exams will count equally for 85% of your final grade. Test dates will depend on the pace of the course, so they will be announced in class. Most likely, the tests will be given in weeks 4 and 7, and on the last day of class.

Participation will not be explicitly graded, but may work for or against you if you are on the border between two grades. I expect you to attend all classes and arrive on time.

The assignments for this course will be posted on Moodle. (Log in at moodle.carleton.edu.) This will be your main source of information for the class, so you should check the Moodle site frequently. All assignments should be completed before class on the date they are listed. I will only accept late assignments with a medical excuse.

Please note: You should work on homework assignments on your own. I will not explicitly forbid you to discuss your short daily assignments with a classmate, but you will jeopardize your success on exams if you rely on others to get through the homework. Longer-term and essay-based assignments must be completed alone.

Academic Honesty:

As you will soon learn, I will post solutions to the homework sets, and you may assume that I have done so in the past. While the assignments may not overlap completely, you could potentially benefit from consulting with a student who has taken this course in the past. This would be considered an academic honesty violation. Likewise, I expect that you will not share homework solutions in the future. Other academic honesty violations include: cheating on exams, copying or paraphrasing material without proper citation, working on essay assignments with a classmate, and fabricating information. Note that you may refer to books, papers, and web sites in your assignments, but you must use proper citations.

All cases of academic dishonesty will be referred to the Academic Standing Committee through the Associate Dean of Students or the Associate Deans of the College. If you are found responsible, disciplinary sanctions range from a formal censure and warning to dismissal from the college. Depending on the offense, your penalty in this course will range from a grade of 0 on the assignment to an F in the course.

Disability accommodations:

Please let me know immediately if you require accommodations for any disability. We will make whatever arrangements are necessary.

Topics:

The following is not a complete syllabus, but a list of the topics I expect to cover. Since you may be unable to access our course Moodle site right away, I have written your first assignment here. All other assignments will be posted on Moodle on roughly a weekly basis.

INTRODUCTION TO GAMES (WEEKS 1 AND 2)

Week 1

- Wednesday, 1/4: Introduction to the course
- Friday, 1/6: Representing games, Extensive form
 - Read Ch. 1 and 2
 - Do Ch. 2 questions 2, 3, 6, and 8 (Addition to question 3: When creating your payoff vectors, assume firms have the same costs and create payoffs that make sense. Explain the payoffs you chose.)

- Beliefs, mixed strategies
- General methodology

STATIC SETTINGS (WEEKS 2 – 4)

- Dominant and dominated strategies
- Best responses
- Nash equilibrium
- Applications, including Cournot oligopoly
- Nash equilibrium in mixed strategies

DYNAMIC SETTINGS (WEEKS 4 – 7)

- Backward induction in extensive form games
- Extensive form applications
- Focal points
- Bargaining
- Repeated games

INFORMATION (WEEKS 7 – 8)

- Random events
- Incomplete information
- Market for lemons
- Auctions
- Signaling

OTHER STRATEGIC CONSIDERATIONS (WEEKS 9 – 10)

- Commitment, threats, and promises
- Incomplete information
- Alternative equilibrium definitions