

**Strategic Behaviour in Economics, ECON 3600A  
Course Outline**

Fall 2020

**Instructor:** Peter Burton                      peter.burton@dal.ca

**Lectures:**        Asynchronous: All course content will be posted on BrightSpace

**Office Hours:**            3 hrs per week    Times to be announced

**Course Description**

This course focuses on the application of game theory to economics. Many economic interactions can be interpreted as games, in which each player's action affects the payoffs of other players. The course concentrates on noncooperative game theory and initially examines both static and dynamic games of complete information. Then it examines static and dynamic games of incomplete information. If time permits, cooperative game theory will be introduced and possibly evolutionary game theory. Students should learn how to recognize various strategic interactions in economics, evaluate the outcomes of such games, and be able to communicate their reasoning.

This course is designed for senior economics majors and economics honours students. As a consequence, it is designed for students with a good background in micro-economic theory (e.g., Econ 2200) and calculus.

**Course Prerequisites (with a grade of C or better)**

ECON 2200.03 or ECON 2210.03 or ECON 2220.03,

MATH 1000.03 or equivalent

**Course Objectives/Learning Outcomes**

Students should have a basic understanding of the applications of game theory to economics.

**Course Materials**

Content will be posted on BrightSpace each week

Required readings may be assigned during the course.

Game Theory References (there is no text)

Binmore, Ken (1992), Fun and Games: A Text on Game Theory, D.C. Heath & Co, Toronto

Dixit, Avinash and Susan Skeath (2014), Games of Strategy, W.W. Norton & Co., New York 4<sup>th</sup> Ed (other editions would be fine)

Fudenberg, Drew and Jean Tirole (1991), Game Theory, MIT Press, Cambridge Mass.

Osborne, Martin (2004), An Introduction to Game Theory, Oxford University Press, Oxford

Varian, Hal (2014), Intermediate Microeconomics: A Modern Approach, W.W. Norton & Co., New York 9<sup>th</sup> Ed. (other editions would be fine) (selected chapters)

**Course Assessment:**

**Weekly quizzes (each marked out of 10) will be assigned based on the previous week's work. There will be 11 quizzes and the course mark will be given by the total of the best 10 of the 11 quizzes. Quizzes will generally be assigned on Mondays and be due to be submitted on BrightSpace that Thursday (at 1700 hrs Atlantic Time). There will be no final exam.**

Quiz	Assigned	Due
1	Sept 14	Sept 17
2	Sept 21	Sept 24
3	Sept 28	Oct 1
4	Oct 5	Oct 8
5	Oct 13*	Oct 16*
6	Oct 19	Oct 22
7	Oct 26	Oct 29
8	Nov 2	Nov 5
9	Nov 16	Nov 19
10	Nov 23	Nov 26
11	Nov 30	Dec 3

(\*The assignment and due dates will be delayed one day on the week of Oct 12-16 due to Thanksgiving).

**Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale and Dalhousie Definition/Explanation of letter grades (17.1 Undergraduate Calendar)**

		Definition	Explanation
A+	90 – 100%	Excellent	Considerable evidence of original thinking; demonstrated outstanding capacity to analyse and synthesize; outstanding grasp of subject matter; evidence of extensive knowledge base.
A	85 – 89%		
A-	80 – 84%		
B+	77 – 79%	Good	Evidence of grasp of subject matter, some evidence of critical capacity and analytical ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.
B	73 – 76%		
B-	70 – 72%		
C+	65 – 69%	Satisfactory	Evidence of some understanding of the subject matter; ability to develop solutions to simple problems; benefitting from his/her university experience.
C	60 – 64%		
C -	55 – 59%		
D	50 – 54%	Marginal Pass	Evidence of minimally acceptable familiarity with subject matter, critical and analytical skills
F	<50%	Inadequate	Insufficient evidence of understanding of the subject matter, weakness in critical and analytical skills; limited or irrelevant use of the literature.

**Course Policies:**

- **Late or missed quizzes will receive zero.**
- **Students should adhere to the University Policy on Academic Integrity (see below) for all work**
- **Students are not permitted to collaborate on quizzes**
- **Quizzes may be required to be submitted or may be submitted to plagiarism detection software**

**Course Content Outline:**

- 1) **Introduction: Noncooperative Game Theory**
  - a) **Strategies and Payoffs**
  - b) **Static vs Dynamic Games**
  - c) **Complete Information vs Incomplete Information**
  - d) **Strategic vs Extensive Forms**
  
- 2) **Static Games of Complete Information**
  - a) **Dominant Strategies, Dominant Strategy Equilibrium**
    - **The Prisoner's Dilemma**
  - b) **Iterative Deletion of Dominated Strategies**
  - c) **Iterative Deletion of Never Best Strategies (Rationalizability)**
    - **War of Attrition**
  - d) **Nash Equilibrium**
    - **Cournot**
    - **Bertrand**
    - i. **Multiple Equilibria, Pure Strategies vs Mixed Strategies**
      - **The Coordination Game**
    - ii. **Possible Nonexistence of Pure Strategy Equilibrium**
    - iii. **Mixed Strategy Equilibrium**
  
- 3) **Dynamic Games of Complete Information**
  - a) **Subgame Perfection**
    - **Entry Deterrence**
    - **Stackelberg**
  - b) **Other Multistage Games**
    - **Alternating Offer Bargaining**
  
- 4) **Static Games of Incomplete Information**
  - a) **Bayesian Equilibrium**
    - **Auctions**
  
- 5) **Dynamic Games of Incomplete Information**
  - a) **Perfect Bayesian Equilibrium**
    - **Education Signalling**
  
- 6) **Cooperative Game Theory**
  - a) **Core**
  - b) **Shapley Value**
  - c) **Nash Bargaining**
  
- 7) **Evolutionary Game Theory**
  - a) **Evolutionary Stable Strategies**

## University Policies and Statements

**This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate**

### **Missed or Late Academic Requirements due to Student Absence**

As per Senate decision instructors may not require medical notes of students who must miss an academic requirement, **including the final exam**, for courses offered during fall or winter 2020-21 (until April 30, 2021). Information on regular policy, including the use of the Student Declaration of Absence can be found here: [https://www.dal.ca/dept/university\\_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html).

### **Academic Integrity**

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

**Information:** [https://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

### **Accessibility**

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

**Information:** [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)

### **Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

**Code:** [https://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

### **Diversity and Inclusion – Culture of Respect**

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

**Statement:** <http://www.dal.ca/cultureofrespect.html>

### **Recognition of Mi'kmaq Territory**

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support.

Visit or e-mail the Indigenous Student Centre (1321 Edward St) ([elders@dal.ca](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

### **Important Dates in the Academic Year (including add/drop dates)**

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

### **University Grading Practices**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

## Student Resources and Support

### Advising

**General Advising** [https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html)

**Science Program Advisors:** <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

**Indigenous Student Centre:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](https://www.dal.ca/campus_life/international-centre/current-students.html)

### Academic supports

**Library:** <https://libraries.dal.ca/>

**Writing Centre:** [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

**Studying for Success:** [https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)

**Copyright Office:** <https://libraries.dal.ca/services/copyright-office.html>

**Fair Dealing Guidelines** <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

### Other supports and services

**Student Health & Wellness Centre:** [https://www.dal.ca/campus\\_life/health-and-wellness/services-support/student-health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html)

**Student Advocacy:** <https://dsu.ca/dsas>

**Ombudsperson:** [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)

### Safety

**Biosafety:** <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

**Chemical Safety:** <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

**Radiation Safety:** <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

**Scent-Free Program:** <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>