

**University of Waterloo**  
**Department of Economics**  
**ECON 445**  
**Industrial Organization**  
**Winter 2024**  
**Tuesday & Thursday 11:30-12:50, AL 105**

**Instructor**

Instructor: Anindya Sen  
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Office Hours: 1:30 – 3 pm Tuesday & Thursday  
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**Course Description**

Why are some firms vertically integrated while others are not? How do firms price their products? How does one measure market structure and hence competition? What is the role of public policy in ensuring competitive markets? These are some of the fascinating questions which I hope to address in this course. In a most simple fashion, economics teaches us that perfectly competitive markets result in an efficient allocation of resources. Producers offer goods priced at marginal cost, while consumers pay prices that reflect their marginal valuation. However, in reality, there are very few industries which are perfectly competitive. This course is a study of different theories of ‘imperfectly competitive’ markets and their implications for prices, output, and welfare.

**Course Goals and Learning Outcomes**

The objective of this course is to educate students on theories of how firms compete with one another in imperfectly competitive markets and the role of public policy

Upon completion of this course, students should be able to:

- Use economic models in order to understand pricing, output and other decisions by firms
- Gain knowledge of policies used by government to protect consumer welfare
- Write a concise and compelling paper on a group project with appropriate cost benefit analysis tools.

Specific abilities to meet goal

**Required Text**

Information on course requirements and assessments.

Assessment	Date of Evaluation (if known)	Weighting
Midterm 1	Thursday February 15th	15%
Midterm 2	Thursday March 21st	20%
Term paper	Due April 15th	25%
Final Exam	To be set by university	40%
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Total		100%

Please note that I do not respond to emails regarding class content. I, however, am happy to schedule an appointment for office hours through email, in order to answer questions and clarify any doubts regarding course content and material.

### **Missed Midterms**

Students who do not have a relevant medical certificate will receive a mark of zero. There is no make up test. Those with a valid excuse will have their midterm weight transferred to the final.

### **Term Paper**

Guidelines for the paper will be distributed in class.

### **Course Outline (Approximate)**

Chapter 1: Introduction

Chapter 2: The Welfare Economics of Market Power

Chapter 3: Theory of the Firm

Chapter 4: Market Power and Dominant Firms

Chapter 5: Non-Linear Pricing and Price Discrimination

Chapter 7: Basic Game Theory and the Nash Equilibrium

Chapter 8: Cournot and Bertrand Competition

Chapter 9: Subgame Perfect Nash Equilibrium and Repeated Games

Chapter 10: Dynamic Models of Oligopoly

Chapter 11: Product Differentiation

Chapter 13: Stackelberg and Entry Games

Chapter 14: Entry Deterrence

Chapter 15: Strategic Behavior: Principles

Chapter 22: Vertical Integration and Vertical Restraints

### **Late Work**

Ten percent will be deducted for the first day, and 5% each day thereafter.

### **Electronic Device Policy**

Students are welcome to bring laptop computers during class. However, they are only meant to be used in a manner that is relevant to what is being taught and discussed in lectures. Browsing of the internet is not permitted as it can be extremely distracting to me and more importantly, to other students.

### **Accommodation for Students with Disabilities:**

Note for students with disabilities - [AccessAbility Services](#), located in Needles Hall, room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the [AccessAbility Services](#) office at the beginning of each academic term.

### **Attendance Policy**

Consistent attendance is highly recommended. I do not construct nor do I offer class notes. I also do not use overheads. My style of teaching is "chalk and talk". Attendance is helpful from the perspective of having a consistent set of notes and also being exposed to in class debates and questions and answers, which are of great importance in the learning process.

### **Academic Integrity**

In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. Check the [Office of Academic Integrity website](#) for more information.

### **Grievance**

A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70, Student Petitions and Grievances, Section 4](#). When in doubt please be certain to contact the department's administrative assistant who will provide further assistance.

### **Discipline**

A student is expected to know what constitutes academic integrity to avoid committing academic offenses and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course professor, academic advisor, or the undergraduate associate dean. For information on categories of offenses and types of penalties, students should refer to [Policy 71, Student Discipline](#) (<http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>). For typical penalties check [Guidelines for the Assessment of Penalties](#) (<http://www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm>).

### **Appeals**

A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72, Student Appeals](#) (<http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm>).

**Mental Health Support:** All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health supports as needed. Full details can be found online at the Faculty of ARTS website.

### On Campus

- Counselling Services: [counselling.services@uwaterloo.ca](mailto:counselling.services@uwaterloo.ca) / 519-888-4567 ext 42655
- MATES: one-to-one peer support program offered by the Waterloo Undergraduate Student Association (WUSA) and Counselling Services

- Health Services Emergency service: located across the creek from Student Life Centre
- A variety of campus groups offer further resources and support, including, but not limited to: GLOW centre for sexual and gender diversity peer support, the Women's Centre, the Waterloo Indigenous Student Centre, UWRaise(Racial Advocacy for Inclusion, Solidarity & Equity), Committee on Access and Disability, Food Support Service, please see WUSA main web page for further services and clubs which may provide more specific and personalized support for you.

Off campus, 24/7

- Good2Talk: Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-4330 x6880 • Here 24/7: Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- OK2BME: set of support services for lesbian, gay, bisexual, transgender or questioning teens in Waterloo. Phone: 519-884-0000 x 213 Download UWaterloo and regional mental health resources (PDF) Download the WatSafe app to your phone to quickly access mental health support information

**Academic freedom at the University of Waterloo:** [-Policy 33, Ethical Behaviour](#) states, as one of its general principles (Section 1), "The University supports academic freedom for all members of the University community. Academic freedom carries with it the duty to use that freedom in a manner consistent with the scholarly obligation to base teaching and research on an honest and ethical quest for knowledge. In the context of this policy, 'academic freedom' refers to academic activities, including teaching and scholarship, as is articulated in the principles set out in the Memorandum of Agreement between the FAUW and the University of Waterloo, 1998 (Article 6). The academic environment which fosters free debate may from time to time include the presentation or discussion of unpopular opinions or controversial material. Such material shall be dealt with as openly, respectfully and sensitively as possible." This definition is repeated in Policies 70 and 71, and in the Memorandum of Agreement, Section 6.

**Intellectual Property:** Students should be aware that this course contains the intellectual property of their instructor, TA, and/or the University of Waterloo.

Intellectual property includes items such as:

- Lecture content, spoken and written (and any audio/video recording thereof)
- Lecture handouts, presentations, and other materials prepared for the course (e.g. lecture slides)
- Questions or solution sets from various types of assessments (e.g. assignments, quizzes, tests, final exams)
- Work protected by copyright (e.g. any work authored by the instructor or TA or used by the instructor or TA with permission of the copyright owner) Course materials, and the intellectual property contained therein, are used to enhance student's educational experience. However, sharing this intellectual

property without the intellectual property owner's permission is a violation of intellectual property rights.

For this reason, it is necessary to ask the instructor, TA and/or the University of Waterloo for permission before uploading or sharing the intellectual property of others online (e.g. to an online repository). Permission from an instructor, TA or the University is also necessary before sharing the intellectual property of others from completed courses with students taking the same/similar courses in subsequent terms/years. In many cases, instructors might be happy to allow distribution of certain materials. However, doing so without expressed permission is considered a violation of intellectual property rights. Please alert the instructor if you become aware of intellectual property belonging to others (past or present) circulating, either through the student body or online. The intellectual property rights owner deserves to know (and may have already given their consent).

**Cross-listed courses:** Please note that a cross-listed course will count in all respective averages no matter under which subject code it has been taken. For example, a PHIL/PSCI cross-list will count in a Philosophy major average, even if the course was taken under the Political Science subject code.

**Instructor Illness & Other Potential Disruptions:** If there is a physical space disruption (e.g. building shutdown) or if the instructor becomes ill for a short space of time, the class will be cancelled for those days and in-class discussions/exercises will be covered in subsequent class periods. Students should keep up with the lecture videos during that time. If the instructor becomes ill for an extended period of time, the department will coordinate appropriate alternative arrangements for the class, and will inform the class as soon as possible. Any broader public health issues (e.g. pandemic lockdowns) are unexpected but always a possibility and will be guided by University policy. In such cases, the instructor will inform the class as soon as possible.

**Territorial Acknowledgement:** We acknowledge that we are living and working on the traditional territory of the Neutral, Anishinaabe and Haudenosaunee peoples. The main campus of the University of Waterloo is situated on the Haldimand Tract, the land promised to the Six Nations that includes six miles on each side of the Grand River. Our active work toward reconciliation takes place across our campuses through research, learning, teaching, and community building, and is centralized within the [Office of Indigenous Relations](#). Learn more about the Anishinaabe, Haudenosaunee, Six Nations and territorial acknowledgement. For more information about the purpose of territorial acknowledgements, please see the CAUT Guide to Acknowledging Traditional Territory.