

**University of Waterloo**  
**Department of Economics**  
**ECON 357: Environmental Economics (Section 001)**  
**Winter 2018**  
**Class Time: Mon.,Wed. 8:30 am - 9:50 am**  
**Classroom: AL 105**

**Instructor and T.A. Information**

Instructor: Predrag Rajsic

Office: HH 162

Office Phone: 519-888-4567 ext. 30174 (please do not leave voice mails)

Office Hours: Tuesdays 9:30 am – 12:30 am or by appointment

Email: [prajsic@uwaterloo.ca](mailto:prajsic@uwaterloo.ca)

T.A. Information: TBA.

**Notes on office hours or contacting instructor**

Office hours for the Final Exam Period will be announced in March.

If a student is not able to meet during office hours, I am open to arranging a mutually convenient appointment via email.

When sending email to your instructor, please always use your University of Waterloo email account.

“**ECON 357**” must appear in the subject line and the message must include **your full name and student ID** number.

Where to find this course outline:

This course outline is available at two locations for the duration of the term:

- Department of Economics website  
<https://uwaterloo.ca/economics/undergraduate/courses/outlines>
- LEARN web site (requires UW user id and password) <http://learn.uwaterloo.ca>

**Course Description**

This course is about the application of microeconomic theory to environmental problems, such as air and water pollution. The purpose of the course is to equip you with the means for understanding how different institutional structures address environmental concerns. We will be drawing from diverse branches of economics such as industrial organization, public finance, and political economy. The course is divided in three main themes. The first theme covers the conceptual groundwork for evaluating environmental outcomes using the economic way of thinking. This theme also provides a quick review of the theory of efficiency of markets and of market failure. The second theme presents and evaluates different institutional structures of dealing with environmental issues. The last theme ties together the previous course materials by using policy implementation analysis.

## Course Goals and Learning Outcomes

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

- Describe and explain the interactions between the human economic activity and the environmental outcomes;
- Explain the economic concepts of property rights, market failure and nonmarket failure and how they relate to environmental problems;
- Discuss the relative advantages and disadvantages of institutional mechanisms for addressing environmental concerns.

## Textbook

*The Economics of the Environment*

Peter Berck, University of California, Berkeley

Gloria Helfand, University of Michigan

ISBN-10: 0321321669 • ISBN-13: 9780321321664

In addition, we will draw some material from the following references. These are not required readings, and I will provide enough information in class for you to be able to understand the concepts that we will draw upon. Those students who have an interest in these topics are encouraged to refer to the readings in more detail.

- Coase, R. H. (1960), "The problem of Social Cost", *Journal of Law and Economics*, 3: 1- 44.
- Fox, G. (2007) "The Real Coase Theorems" *Cato Journal*, 27(3):373-396.
- Wolf, C (1979) "A Theory of Non-Market Failure: Framework for Implementation Analysis" *Journal of Law and Economics*, 21(1):107-139.
- Hasnas, J. (2009) "Two Theories of Environmental Regulation" *Social Philosophy and Policy*, 26(2, July):95-129.
- Brubaker, E. (1995) *Property Rights in the Defence of the Environment*, Earthscan Publications, Toronto
- Deaton, B. J. & Vyn, R. J. (2015). The effect of Ontario Greenbelt on the price of vacant farmland. *Canadian Journal of Agricultural Economics* 63 (2): 185-208.
- Rajsic, P., G. Fox and E. Ramlal (2012) "Canadian Agricultural Environmental Policy". In Brouwer F., G. Fox and R. Jongeneel (Eds.), *The Economics of Regulation in Agriculture: Compliance with Public and Private Standards*. Wallingford, UK: CABI Publishing.

## Readings Available on LEARN

- LEARN web site <http://learn.uwaterloo.ca>
- Announcements, lecture slides, midterm solutions, practice problems
- Online Review Quizzes (see below under *Review Quizzes*)

The LEARN site is down occasionally. Save the course materials to your computer as soon as they are posted. Always be prepared!

Examinations in this course are based on the material contained in the textbook and the presented lecture content (which are strong complements, not substitutes...see Policy on Class Attendance).

- Two sets of practice problems and exercises will be distributed throughout the term. Solutions to the problems will be reviewed in class in preparation for the midterm and the final exam. You are strongly encouraged to work on the practice problems and exercises in study groups. This constitutes a great way to help each other in your learning process. However, I expect every student to reflect personally on the questions prior to group discussions, and to make sure that he/she is able to write up as well as understand the solutions to the problems.

## Course Requirements and Assessment

- Students will be evaluated based on the following activities:

- Essay

An essay on a topic to be chosen from a list that will be distributed early in the term. Alternatively, you may opt to write on any environmental related issue of your choice, which must be approved in advanced by the instructor. This exercise, which can be done either individually or in a group consisting of at most two students, is a chance for you to apply the theoretical skills you will gain from the course to analyze a real- world environmental problem. The essay should be typed, double-spaced, and between 12 and 14 pages long (excluding the bibliography, figures, and tables). The essay will be graded in two parts. The first part consists in an outline of the essay topic (description of the main issues and annotated bibliography), which is due on February 14<sup>th</sup> by the end of class. The second part consists in the final draft and is due on April 4<sup>th</sup> by the end of class. Late submissions of the outline and/or final draft will be given a 5% penalty per each calendar day or part of the day that they are late. More details about the essay will be provided in class.

- Midterm

The midterm test to be written on Wednesday February 28<sup>th</sup> during class time. The midterm will cover all material discussed in class up to the midterm date. More details about the content and the format of the test will be provided in class.

- Final exam

The final exam will be scheduled by the registrar’s office during the official examination period. The final exam will be cumulative, i.e. it will cover all material discussed in class and all required readings during the entire term. The format of the final exam will be similar to that of the midterm.

- Review Quizzes

There will be five review quizzes throughout the semester. They will be announced in class and in LEARN. The purpose of the review quizzes is to help students identify and understand key concepts covered in the lectures and in the textbook. The format of the quizzes will mainly be multiple-choice questions, but there may also be some true-false questions, or short answer questions. The quizzes will be done online through the LEARN system. There will be a limited, but a reasonably long, time window set up in LEARN during which each quiz will be available for completion. There are two attempts for each quiz available and the better attempt counts. Quizzes that are not submitted on time will automatically receive a grade of zero. The quizzes are “open-book”.

- Participation

Participation is recommended, and it will be rewarded through bonus marks up to the total of two percentage points (2%) that will be added to the students’ final grade. Participation will be monitored through an online tool Learning Catalytics. The primary purpose of this tool in this class is to enhance the feedback mechanism between students and the instructor so that we can identify areas that may require special focus. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. Your participation grade will **not** depend on the correctness of your answers to the in-class questions.

The overall mark for the course will be determined as follows:

| Assessment                           | Date of Evaluation                              | Weighting |
|--------------------------------------|-------------------------------------------------|-----------|
| Review Quizzes                       | TBA                                             | 5%        |
| Essay - Outline                      | Wednesday, February 14 <sup>th</sup>            | 2.5%      |
| Midterm                              | Wednesday, February 28 <sup>th</sup> , in-class | 22.5%     |
| Essay - Final Draft                  | Wednesday, April 4                              | 20%       |
| Final Exam                           | TBA by the registrar                            | 50%       |
| Bonus for participation <sup>1</sup> |                                                 | 2%        |
| Total                                |                                                 | 100%      |

<sup>1</sup> If a student’s Total grade, including participation, is more than 100%, the participation grade is applied up to the value that produces the Total grade of 100%. Otherwise, the full participation grade is applied.

## Learning Catalytics

We will be using the Learning Catalytics classroom response system in class. Included with the purchase of a new text is a subscription to Learning Catalytics, which is a web based student response system - please bring a smart device (laptop, tablet, or smart phone) or a text-capable cell phone to class.

If you do not have a new text, codes can be purchased separately through the bookstore as it is the cheapest option - **\$17.25 CND for 12 months.**

Through the Learning Catalytics website the cost is \$12 **USD** (6 months) or \$20 **USD** (12 months).

To register please visit [www.LearningCatalytics.com](http://www.LearningCatalytics.com).

Please reference the step-by-step login document for detailed instructions. Under the Training & Support tab, you will find helpful information including technical support.

Please email the Rep Kyle if you need anything at all - [kyle.monotiuk@pearsoned.com](mailto:kyle.monotiuk@pearsoned.com).

## Midterms and the Final Exam

- The format for the midterm and the final exam will be a mix of multiple-choice questions and written problems.
- The midterm test will be written during the class time.
- The final exam period for the Winter Term 2018 is April 9 – 24 inclusive. Students are expected to be available during this time. Travel plans are not acceptable grounds for granting an alternative final examination time. <http://uwaterloo.ca/registrar/final-examinations/examination-regulations-and-related-matters>
- The exact date and time for the final exam for this class will be determined by the Registrar's Office. The exam schedule is posted online, will be announced in class, and posted on LEARN.
- Only the Registrar's Office can issue final grades.

This grading policy will be implemented strictly for all students in the course (with the exception of verified illnesses – see below).

## Missing a Midterm Due to Illness During the Term

- Missing a midterm will automatically result in a grade of zero for that midterm. If the illness can be documented with a UW Verification of Illness Form (the only acceptable document), with approval you may transfer the weight of the missed midterm to the final exam. This remedy is a privilege and not a right.

- The midterm exam schedule has been set and will not be changed for whatever reason (no make-up midterm exams will be offered).

### Missing the Final Exam Due to Illness

- Missing the final exam is a very serious matter which automatically results in a grade of zero for the final exam and possibly a failing grade for the course. Please carefully read the Economics Department policy on deferred final exams for instructions.
- No deferred final exam will be provided for students who missed all the exams (including the final exam) in this course

### Economics Department Deferred Final Exam Policy

- Deferred Final Exam Policy found at <https://uwaterloo.ca/economics/undergraduate/resources-and-policies/deferred-final-exam-policy>.

**Policy on remarking of Tests:** If you feel that your test was not marked properly, you must advise the instructor within 5 business days of the date on which the test is handed back to the class. Any student that submits a test for remarking should understand that the entire test will be remarked and that their grade may improve, remain unchanged or perhaps even decrease as a result of the remarking process.

### Course Outline

This class schedule is ambitious. Modifications and/or eliminations of certain content might be required given our limited time together. Any necessary modifications or eliminations to the course content will be communicated to you in the regular class period.

| Week | Date            | Theme                                                 | Readings Covered                                                     |
|------|-----------------|-------------------------------------------------------|----------------------------------------------------------------------|
| 1    | January 3       | Introduction to Course<br>Markets and the Environment | Ch. 1 Economics and the Environment                                  |
| 2    | January 8, 10   | Markets and the Environment                           | Ch. 2 Supply and Demand: Market Forces and The Environment           |
| 3    | January 15, 17  | Markets and the Environment                           | Ch. 3 Markets and Market Failure                                     |
| 4    | January 22, 24  | Environment as a Good                                 | Ch. 4 Consumer Behavior and the Environment                          |
| 5    | January 29, 31  | Environment as a Good                                 | Ch. 5 Measuring Benefits to Consumers                                |
| 6    | February 5, 7   | Measuring Environmental Benefits                      | Ch. 6 Revealed Preference Methods<br>Ch. 7 Stated Preference Methods |
| 7    | February 12, 14 | Production and the Environment                        | Ch. 8 From Production to Pollution                                   |
| 8    | February 19, 21 | <i>Reading Week</i>                                   | No Classes                                                           |

| Week | Date            | Theme                                                                                 | Readings Covered                                                                                                   |
|------|-----------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 9    | February 26, 28 | Production and the Environment<br><b>Midterm, in class, February 28</b>               | Ch 9. Production, Pollution, Output, and Prices                                                                    |
| 10   | March 5, 7      | Production and the Environment<br>Policy Analysis                                     | Ch 9. Production, Pollution, Output, and Prices<br>Ch. 10 Maximizing Net Benefits in the Presence of Externalities |
| 11   | March 12, 14    | Policy Analysis                                                                       | Ch. 11 Private Markets and the Environment                                                                         |
| 12   | March 19, 21    | Policy Analysis                                                                       | Ch. 12 Government Policies for Environmental Protection                                                            |
| 13   | March 26, 28    | Policy Analysis                                                                       | Ch. 13 Enforcement and Political Economy                                                                           |
| 14   | April 2, 4      | Policy Analysis<br>Reflections on the Learning Method<br>Discussion of the Final Exam | Wolf (1979) "A Theory of Non-Market Failure: Framework for Implementation Analysis"                                |

## Late Work

Late submission of exam papers is not accepted and missed submissions will receive a zero mark for whatever reason.

- Exam papers must be submitted in whole and on time in the exam room. Exam papers
  - a) not submitted on time
  - b) submitted with missing pages,
  - c) submitted elsewhere, with the exception of students with permission to write in the AS Office
  - d) not received at all

will receive a grade of zero for whatever reason.

## Electronic Device Policy

- Laptop computers or other electronic devices (i.e., Apple or Android smartphones and tablets) may only be used to view lecture material or to access the Learning Catalytics page for this course.
- Photographic devices are not permitted in class due to copyright and privacy issues.
- Audio or video recording devices are not permitted in class due to copyright and privacy issues.

## Attendance Policy

Class attendance is an integral part of your educational experience. It is an important factor in ensuring your complete understanding of the material presented. You are responsible for all material presented in the scheduled lecture periods whether you choose to attend lectures or not.

### **Classroom Protocols**

- I do NOT lend my lecture notes to students for any reason.
- In order to maintain a productive learning environment in the classroom, we all need to show the highest level of courtesy and professional behaviour. Please be punctual and turn off all audible ringers on all devices during class.
- As a courtesy to the custodial staff, if you have coffee, water, etc., please dispose of your garbage when you leave the classroom.
- Please leave your private conversations for after the class.

### **Economics Department Deferred Final Exam Policy**

Deferred Final Exam Policy found at <https://uwaterloo.ca/economics/undergraduate/resources-and-policies/deferred-final-exam-policy>.

### **Mental Health Support**

All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health supports if they are needed.

### **On Campus**

- Counselling Services: [counselling.services@uwaterloo.ca](mailto:counselling.services@uwaterloo.ca) / 519-888-4567 xt 32655
- [MATES](#): one-to-one peer support program offered by Federation of Students (FEDS) and Counselling Services
- Health Services Emergency service: located across the creek from Student Life Centre

### **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: 519-749-433 ext. 6880
- [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 extension 213

## **Institutional-required statements for undergraduate course outlines approved by Senate Undergraduate Council, April 14, 2009**

### **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. See the [UWaterloo Academic Integrity webpage](#) and the [Arts Academic Integrity webpage](#) for more information.

## **Discipline**

A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (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. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#). For typical penalties check the Guidelines for the Assessment of Penalties <https://uwaterloo.ca/secretariat/policies-procedures-guidelines/guidelines/guidelines-assessment-penalties>.

## **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 (<https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-70>). When in doubt, please be certain to contact the department’s administrative assistant who will provide further assistance.

## **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](#) (<https://uwaterloo.ca/secretariat-general-counsel/policies-procedures-guidelines/policy-72>).

## **Note for Students with Disabilities**

The [AccessAbility Services](#) office, located on the first floor of the Needles Hall extension (NH 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 AS office at the beginning of each academic term.

## **If Using Turnitin in your Course**

**Turnitin.com:** Text matching software (Turnitin®) will be used to screen assignments in this course. This is being done to verify that use of all material and sources in assignments is documented. Students will be given an option if they do not want to have their assignment screened by Turnitin®. In the first week of the term, details will be provided about arrangements and alternatives for the use of Turnitin® in this course.

*Note: students must be given a reasonable option if they do not want to have their assignment screened by Turnitin<sup>®</sup>. See [guidelines for instructors](#) for more information.*

## **Faculty of Arts-required statements for undergraduate course outlines**

### **Cross-listed Course (if applicable)**

Please note that a cross-listed course will count in all respective averages no matter under which rubric 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 rubric.