

**University of Waterloo**  
**Department of Economics**  
**Econ 255 – Introduction to the Economics of Natural Resources**  
**Spring –2024**

**Instructor:** Nafeez Fatima

**E-mail Address:** [n2fatima@uwaterloo.ca](mailto:n2fatima@uwaterloo.ca)

**Office Hours:** Mondays and Wednesdays from 8.30 am to 10.00 am

(Video chat on WebEx, other times by appointment only)

**Lecture Hours and Location:** Tuesdays and Thursdays from 10.00 am to 11.30 am in UTD 105

**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 userid and password): <http://learn.uwaterloo.ca>

**Course Description**

This course uses the theory and tools of economics to explore key problems in natural resource use and management. The meaning and implications of natural resource scarcity are explored, as well as how the insights of economics can be used to guide policies to promote a more sustainable path for our future. The course examines issues of economic efficiency and equity in specific resource sectors such as energy resources, fisheries, forestry, and water.

**Course Objectives**

The objective of this course is to introduce students to the issues specific to the use and management of natural resources. Natural resource economics is a branch of neoclassical economics that uses the tools of standard economics to the topic of non-renewable and renewable natural resources. The study of natural resource economics draws from both microeconomics and macroeconomics, but primarily from microeconomics. It uses the standard microeconomic tools to understand how to extract and harvest or use natural capital inputs. In this course, we will seek to understand the meaning and implications of natural resource scarcity and how the insights of economics might be used to promote a more sustainable path for our future. We begin

with basic economic concepts such as static and dynamic efficiency, property rights and market failures. We then apply these concepts to the management of key resources such as energy resources, fisheries, forestry, and water.

### **Prerequisites**

Econ 101 or Econ 100/COMM 103

### **Required Textbooks**

The required textbook for this course is:

Tom Tietenberg & Lynne Lewis, "*Environmental & Natural Resource Economics*", 11<sup>th</sup> Edition, Routledge, 2018. **(Tietenberg)**

### **Recommended Textbooks (purchase not necessary)**

1. Herman Daly & Joshua Farley, "*Ecological Economics: Principles and Applications*", 2<sup>nd</sup> Edition, Island Press, 2010. **(Daly)**

2. Roger Perman, Yue Ma, James McGivary & Michael Common, "*Natural Resource & Environmental Economics*", 3<sup>rd</sup> Edition, Pearson, 2003 **(Perman)**

### **Communication with Instructor**

Regarding email communication, students should use the university e-mail address.

When sending email, "Econ 255" must appear in the subject line and the message must include your full name and ID number.

### **Course Evaluation**

Student evaluation for this course will consist of two in-class midterm exams and a final exam. Final exam will be comprehensive; it will include all materials covered in this course. The final exam schedule will be released by the Registrar's Office on May 31.

The final exam period for Spring term is from August 4 to August 16. Students are expected to be available during this time. An alternative final exam time is not allowed on the ground of travel plans.

## **Exam Schedule & Mark Breakdown**

<b>Exams</b>	<b>Date</b>	<b>Syllabus</b>	<b>Weight</b>
<b>Midterm 1</b>	<b>Tuesday, June 11, 2024</b>	<b>Chapters 1-5</b>	<b>25%</b>
<b>Midterm 2</b>	<b>Tuesday, July 16, 2024</b>	<b>Chapters 6-9</b>	<b>25%</b>
<b>Final</b>	<b>TBA</b>	<b>Comprehensive</b>	<b>50%</b>

### **Policy for Missed Midterm Exams**

If a student unable to complete a course component due to self-declared COVID-related reasons or a two-day short-term absence then you should submit a self-declaration of absence through Quest. If your absence is due to an illness not pandemic-related, then a UW Verification of Illness form, completed by a health professional, must be uploaded and submitted through the Verification of Illness or Extenuating Circumstances Process. The VIF is the only acceptable documentation for an absence due to illness. Do not submit the VIF or any other medical documentation to your instructors, teaching assistants, or other course personnel.

If your absence is due to other extenuating circumstances (e.g., bereavement), then you must submit all documentation related to the absence (e.g., obituary) through the Verification of Illness or Extenuating Circumstances Process. Submission through the VIF or Extenuating Circumstances System, once approved, will notify your instructors of your absence.

If your absence is due to a religious or spiritual observance please inform the instructor within two weeks of the announcement of the due date for which the accommodation is being sought.

There is NO make-up exam for this course. If a student is unable to write the exam for documented reasons (for the reasons discussed above) with approval, the weight of the missed exam will be transferred to the final.

### **Policy for Missed Final Exam**

All deferred Final Exam requests for economics courses are administered by the Economics Undergraduate Office. Please consult the Deferred Exam Policy at <https://uwaterloo.ca/economics/undergraduate/resources-and-policies/deferred-final-exam-policy>.

This grading policy will be implemented strictly for all students in the course with the exception of verified illnesses.

### **Grades**

Exam marks will be posted on Learn. Posting grades in public places or sending grades by e-mail are prohibited by university regulations.

### **Remarking Policy**

If any student feels that the exam is not marked properly, he/she must inform the instructor within 6 days of the date on which the grades are posted on Learn. Please be advised that the entire test will be remarked and the grade may improve, remain unchanged or perhaps even decrease as a result of the remarking process.

### **Attendance Policy**

Although it is not mandatory, attendance is highly recommended for tutorial sessions. Student participation in tutorial sessions is also highly encouraged. Students are welcome to ask any question during the regular office hours.

### **Chapters (Titenberg)**

Chapter 1: Visions of the Future

Chapter 2: The Economic Approach: Property Rights, Externalities, and Environmental Problems

Chapter 3: Evaluating Trade-Off: Benefit-Cost Analysis and Other Decision-Making Metrics

Chapter 4: Valuing the Environment: Methods

Chapter 5: Dynamic Efficiency & Sustainable Development

Chapter 6: Depletable Resource Allocation: The Role of Longer Time Horizons, Substitutes, and Extraction Cost

Chapter 7: Energy: The Transition from Depletable to Renewable Resources

Chapter 8: Recyclable Resources: Minerals, Papers, Bottles and E-Waste  
 Chapter 9: Water: A Confluence of Renewable and Depletable Resources  
 Chapter 10: A Locally Fixed, Multipurpose Resource: Land  
 Chapter 11: Storable, Renewable Resources: Forests  
 Chapter 13: Ecosystem Goods & Services: Nature’s Threatened Bounty (Time permitting)  
 Chapter 20: The Quest for Sustainable Development

**Tentative Class Schedule & Reading List**

<b>Week</b>	<b>Date</b>	<b>Lecture Topics and Related Readings</b>
1	May 7 May 9	Introduction to the course and course outline Chapter 1: Visions of the Future & Chapter 2: The Economic Approach: Property Rights, Externalities and Environmental Problems
2	May 14 May 16	Chapter 2: The Economic Approach: Property Rights, Externalities and Environmental Problems
3	<b>May 21</b> May 23	<b>No class – Monday Schedule</b> Chapter 2: The Economic Approach: Property Rights, Externalities and Environmental Problems
4	May 28 May 30	Chapter 3: Evaluating Tradeoffs: Benefit-Cost Analysis and Other Decision-making Metrics
5	June 4 June 6	Chapter 4: Valuing the Environment Methods Chapter 5: Dynamic Efficiency and Sustainable Development & Review
6	<b>June 11</b> June 13	<b>Midterm Exam 1: Chapters 1-5</b> Chapter 5: Dynamic Efficiency and Sustainable Development & Review

7	June 18 June 20	Chapter 6: Depletable Resource Allocation: The Role of Longer Time Horizons, Substitutes, and Extraction Cost
8	June 25 June 27	Chapter 7: Energy: The Transition from Depletable to Renewable Resources
9	July 2 July 4	Chapter 8: Recyclable Resources: Minerals, Papers, Bottles and E-Waste
10	July 9 July 11	Chapter 9: Water: A Confluence of Renewable and Depletable Resources
11	<b>July 16</b> July 18	<b>Midterm Exam 2: Chapters 6, 7, 8 &amp; 9</b> Chapter 10: A Locally Fixed, Multipurpose Resource: Land
12	July 23 July 25	Chapter 11: Storable, Renewable Resources: Forests
13	July 30	Chapter 20: Quest for Sustainable Development & Review for Final Exam <b>(Make-up class for May 21)</b>

### **Tentative Class Schedule and Reading List**

**\*\*\*\*This course schedule is tentative. There may be addition or slight modification in this schedule given the pace of the class. \*\*\*\***

### **Journal Articles: (time permitting will be discussed after each topic)**

1. K. Arrow *et al* (2005), "Economic growth, Carrying Capacity, and the Environment", *Ecological Economics*, 15, p. 91-95
2. Herman Daly (September 2005), "Economics in a Full World", *Scientific American*, p. 100-107.
3. Jeremy Brown (April 2005), "Travelling the Environmental Kuznets Curve", *Fraser Forum*, p. 16-17.
4. Severin Borenstein (2012) "The Private and Public Economics of Renewable Electricity Generation", *Journal of Economic Perspectives*, 26, 67-92.5.3
5. Christopher Costello, S. Gaines, and J. Lynham (2008) "Can Catch shares Prevent Fisheries Collapse?", *Science*, 321, p. 1678-1681

6. S. Olmstead and R. Stavins (2009) "Comparing Price and Nonprice approaches to Urban Water Conservation", *Water Resources Research*, pg.45
7. D. Pearce, B. Groom, C. Hepburn, and P. Koundouri (2003) "Valuing the Future: recent advances in Social Discounting", *World Economics*, 4(2), p.121-41.
8. James Smith (2009) 'World oil: market or mayhem?', *Journal of Economic Perspectives*, 23(3), p. 145-164.
9. James Smith (2012) 'Does Speculation drive Oil Prices?', *Resources Magazine*, 181, Resources for the Future.
10. Sustainable Prosperity (2011) 'Economic instruments for Water Management in Canada: Case studies and barriers to implementation', Policy Brief, Sept. 2011
11. Katherine Keil, Victor Matheson and Kevin Golembiewski (July 7, 2009), "Luck or Skill? An Examination of the Ehrlich-Simon Bet", Can be retrieved from [http://www.holycross.edu/departments/economics/RePEc/Kiel-Matheson\\_EhrlichSimon.pdf](http://www.holycross.edu/departments/economics/RePEc/Kiel-Matheson_EhrlichSimon.pdf)
12. Thomas Princen (2001), "Consumption and its Externalities: Where Economy Meets Ecology", in *Global Environmental Politics*, 1(3), p.11-30

### **Administrative Policy**

#### **Anti-Racism Statement**

The University of Waterloo does not tolerate racism or any other form of discrimination and expects campus community members to contribute to a culture where all members feel safe and valued. Any member of the campus community who has experienced racism or discrimination at the University is encouraged to review available processes for addressing their concerns under Policy 33 – Ethical Behaviour and to seek guidance from the Equity Office via email at [equity@uwaterloo.ca](mailto:equity@uwaterloo.ca) or through their [website](#)

#### **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., PowerPoint slides);

- Questions or solution sets from various types of assessments (e.g., assignments, quizzes, tests, final exams); and
- 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 a 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 and 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).

### **Mental Health Support**

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

### **On campus supports**

All of us need a support system. The faculty and staff in Arts encourage students to seek out mental health and counselling if they are needed. For counselling (individual or group) reach out to [Campus Wellness and Counselling Services](#). Counselling Services strives to provide a secure, supportive environment for students of all orientations and backgrounds. They offer confidential counselling for a variety of areas including anxiety, stress management, depression, grief, substance use, sexuality, relationship issues, and much more.



### **Other on-campus supports**

- [MATES](#): one-to-one peer support program offered by the Waterloo Undergraduate Student Association (WUSA) and Counselling Services
- Download the [WatSafe app](#) to your phone to quickly access mental health support information
- [Empower Me](#): to access create an account on the Dialogue mobile app or on the web at [www.studentcare.ca/dialogue](http://www.studentcare.ca/dialogue)
- [Sexual Violence Prevention and Response Centre](#) - supports all members of the University of Waterloo campus community who have experienced or been impacted by sexual violence.

### **Off campus supports**

- [Good2Talk](#): Free confidential help line for post-secondary students. Phone: 1-866-925-5454
- Grand River Hospital: Emergency care for mental health crisis. Phone: 519-749-4300
- [St. Mary's Hospital](#) - 519-744-3311
- [Here 24/7](#): Mental Health and Crisis Service Team. Phone: 1-844-437-3247
- 988 Suicide Crisis Helpline: a 24/7 urgent mental health care three-digit helpline
- [OK2BME](#): set of support services for Two-Spirit, lesbian, gay, bisexual, trans, queer, intersex, asexual (@SLGBTQIA+) and questioning kids, teens, adults, and their families in Waterloo Region. Phone: 519-884-0000 or e-mail [ok2bme@caminowellbeing.ca](mailto:ok2bme@caminowellbeing.ca)
- [Sexual Assault Support Centre of Waterloo Region](#) - offers individual counselling to people of all genders, 16+ who have been sexually assaulted at any point in their lives. As well as short-term support for family members or friends of sexual assault survivors. Also, information and referrals
- More information about resources and supports for students can be found online in on the [Faculty of Arts Student Support](#) page.

## **Territorial Acknowledgement**

The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg, and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted 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](#).

## **University Policy**

**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](#) for more information.]

**Grievance:** A student who believes that a decision affecting some aspect of their 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 an academic offence, and to take responsibility for their actions. [Check [the Office of Academic Integrity](#) for more information.] 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 instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to [Policy 71, Student Discipline](#). For typical penalties, check [Guidelines for the Assessment of Penalties](#).

**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 they have a ground for an appeal should refer to [Policy 72, Student Appeals](#).

**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 AccessAbility Services at the beginning of each academic term.

**Turnitin.com:** Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit alternate assignment.