

**University of Waterloo**  
**Department of Economics**  
**ECON 361, Cost Benefit Analysis & Project Evaluation**  
**Fall 2014**  
**Course Outline**

**Instructor:** Fiona T. Rahman

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**Lecture Hours & Location:** 1:00pm -2:20pm MW, E2 1303

**Office Hours:** Thursday 1:15pm – 2:45 pm, (Other times by appointment only)

**Course Description:** Cost-benefit analysis provides an analytical framework for conducting economic analysis of public policy. It offers a practical and systematic approach for comparing a proposal's monetized social costs and benefits and thereby assisting governments, regulatory bodies and other agencies in their project evaluation as well as decision making. Applications of CBA is significant in analyses of infrastructure projects, environmental and safety regulations, social and educational programs, healthcare policies, use of natural resources including forests and fisheries and in many other arena.

This course will introduce students to the principles of cost benefit analysis including consideration of welfare economics, the treatment of intangibles, non-efficiency considerations, time discounting, evaluation criteria, uncertainty and risk. At the end of the term, students will not only know how to conduct a CBA, but also understand the limitations and controversies associated with it.

**Prerequisite:** ECON201, ECON221

**Required Textbook**

Boardman, A. Greenberg, D. Vining, A. Weimer, A. (2010). Cost Benefit Analysis: Concept and Practice (4th Edition). Prentice Hall.

**Note:** this text is also available electronically at a reduced cost from CourseSmart. For more information, please see <http://www.coursesmart.com/students>

<b>Evaluation</b>	<b>Percent of final grade</b>	<b>Date</b>	<b>Time</b>
Assignment 1 ( Individual)	10%	Due Wednesday, October 8	In class
Midterm Test	25%	Wednesday, October 29	Class time
Assignment 2 (Group) (A written review and presentation of a CBA paper)	10%	Written part due Wednesday, Nov 19. Presentation will take place on Nov 19, Nov 24 & Nov 26	Class time
Final Exam	55%	Scheduled by the registrar	

## Important Notices

- The penalty for late assignment is 1 mark per day. Students submitting identical assignments will be highly penalized.
- There is no deferred or make-up midterm tests. If you miss the test due to illness and have a valid medical documentation, then the weight of the test will be shifted to the final exam. Otherwise, a mark of zero will be given to the missed test.
- The final exam will be comprehensive. The date for the final exam is determined by the Registrar's Office. The final exam period for Fall Term 2014 is December 4 to December 19. Students are expected to be available during this time. Travel plans are not acceptable grounds for granting an alternative final examination time.
- To maintain a classroom environment that is conducive to learning, I expect the highest level of courtesy and professional behavior from every student. In particular, be punctual and turn off all audible ringers on phones and other electronic devices during class.

## Lecture Topics:

1. Introduction, Types of CBA, The Basic Steps of CBA (Chapter 1)
2. Discounting Benefits and Costs in Future Time periods (Chapter 6)
  - Comparing Projects with Different Time Periods
  - Real versus Nominal Dollars
3. Microeconomic foundations of CBA : Measuring Efficiency & Changes in Welfare (Chapter 2 & 3)
  - a) Pareto improvement, Pareto efficient, Pareto inefficient,
  - b) potential Pareto frontier, Pareto frontier
  - c) Willingness to Pay (WTP)
  - d) Opportunity Cost
  - e) Pareto Efficiency – Kaldor-Hicks Criterion
  - f) Relationship Between Demand Curve and the Reservation Price Curve
  - g) Changes in Consumer Surplus, Producer Surplus
  - h) Social Surplus
  - i) Compensating Variation
  - j) Equivalent Variation
4. Valuing benefits and costs in primary markets (Chapter 4)
  - Valuing Outcomes: Willingness to Pay
  - Valuing Inputs: Opportunity Cost
5. Valuing benefits and costs in secondary markets (Chapter 5)
  - Valuing Benefits and Costs in Efficient Secondary Markets
  - Valuing Benefits and Costs in Distorted Secondary Markets
6. Valuation Using Observed Behaviour: Indirect Estimation (Chapter 14)
  - a) Market Analogy Method
  - b) The Trade-Off Method
  - c) Intermediate Good Method
  - d) Asset Valuation Method
  - e) Hedonic Pricing Method
  - f) Travel Cost Method
  - g) Defensive Expenditure Method

7. Shadow Prices From Secondary Markets (Chapter 16)
  - Best Estimate Shadow Prices and Approaches
  - Crime, Nature & Pollution
  - Transferring and Adjusting Shadow Prices for Use
8. Risk and Uncertainty (Chapter 7, Pages 167 -187)
  - Introduction to Risk and Uncertainty
  - Sensitivity Analysis
  - Conceptual Foundations of Risk

\*A specific timetable indicating topics for specific lecture dates will not be provided. Our progress will depend on class ability and interest in the lecture materials.

**Resources:** Lecture slides and Problem sets will be posted to <http://learn.uwaterloo.ca> at 1149 -Fall2014 - ECON 361 Cost benefit Analysis & Projects Evaluation

**Articles of Interest:**

1. A.E. Boardman, A.R. Vining and W.G. Waters, II, "Costs and Benefits through Bureaucratic Lenses: Example of a Highway Project," *Journal of Policy Analysis and Management* 12:3, 1993, 532-555. (Reprinted in D. Weimer (ed.), *Cost-Benefit Analysis and Public Policy*, Hoboken, NJ: Wiley-Blackwell, 2008, and A. Schmitz, B.H. Griffin and R.O. Zerbe Jr. (ed.), *Applied Benefit-Cost Analysis*, International Library of Critical Writings in Economics, Cheltenham, UK: Edward Elgar, 2009, Ch. 19).
2. A.E. Boardman, W.L. Mallery, and A.R. Vining, "Learning from *Ex Ante/Ex Post* Cost-Benefit Analysis Comparisons: The Coquihalla Highway Example," *Socio-Economic Planning Sciences* 28:2, 1994, 69-84
3. A.E. Boardman, D.H. Greenberg, A.R. Vining and D.L. Weimer, "'Plug-in' Shadow Price Estimates for Policy Analysis," *Annals of Regional Science* 31:3, 1997, 299-324
4. Moore, M. A., Boardman, A. E., Vining, A. R., Weimer, D. L. and Greenberg, D. H. (2004), "Just give me a number!" Practical values for the social discount rate. *J. Pol. Anal. Manage.*, 23: 789-812. doi: 10.1002/pam.20047
5. A.E. Boardman and D. Forbes, "A Benefit-Cost Analysis of Private and Semi-Private Hospital Rooms," *Journal of Benefit-Cost Analysis* 2:1, 2011, Article 3
6. Guillermo-Peon, Sylvia B. / Harberger, Arnold C, "Measuring The Social Opportunity Cost of Labor In Mexico", *Journal of Benefit-Cost Analysis*. Volume 3, Issue 2, Pages -, ISSN (Online) 2152-2812, DOI: [10.1515/2152-2812.1104](https://doi.org/10.1515/2152-2812.1104), May 2012
7. Gillespie, Rob / Kragt, Marit E, "Accounting for Nonmarket Impacts in a Benefit-Cost Analysis of Underground Coal Mining in New South Wales, Australia", *Journal of Benefit-Cost Analysis*. Volume 3, Issue 2, Pages -, ISSN (Online) 2152-2812, DOI: [10.1515/2152-2812.1101](https://doi.org/10.1515/2152-2812.1101), May 2012

8. Hammitt, James K. / Robinson, Lisa A, "The Income Elasticity of the Value per Statistical Life: Transferring Estimates between High and Low Income Populations", *Journal of Benefit-Cost Analysis*. Volume 2, Issue 1, Pages –, ISSN (Online) 2152-2812, DOI: [10.2202/2152-2812.1009](https://doi.org/10.2202/2152-2812.1009), January 2011
9. Cohen, M. (2010) "Deterring Oil Spills: Who Should Pay and How Much?" RFF Backgrounder. Washington, DC: Resources for the Future
10. De Joode, J. et al. (2004) "Energy Policies and Risks on Energy Markets; A cost-benefit analysis." *CPB Special Publications* 51, CPB Netherlands Bureau for Economic Policy Analysis.
11. Jalaludin and al. (2009) "A Methodology for Cost-Benefit Analysis of Ambient Air Pollution Health Impacts" Commonwealth of Australia
12. Viscusi, W. and J. Aldy (2003) "The Value of a Statistical Life: A Critical Review of Market Estimates throughout the World." *Journal of Risk and Uncertainty* 27: 5-76.
13. Kotchen and Burger (2007) "Should We Drill in the Arctic National Wildlife Refuge? An Economic Perspective," *Energy Policy*
14. Tobias and Mendelsohn (1991) "Valuing Ecotourism in a Tropical Rainforest Reserve," *Ambio*.
15. Abdalla et al. (1992) "Valuing Environmental Quality Changes Using Averting Expenditures: An Application to Ground Water Contamination," *Land Economics*

## **Additional Information:**

### **1. Missing the Final Exam Due to Illness**

- Missing the final exam is a very serious matter which automatically results in a zero mark for the exam itself and possibly a failing mark for the course. Read the department policy on deferred final exams <https://uwaterloo.ca/economics/current-undergraduates/policies-and-resources/deferred-final-exam-policy>
- No deferred final exam will be provided for students who missed all the exams (including the final exam) in this course.

### **2. Submissions of Exam Papers**

- Late submission of exam papers is not accepted and missed submission will receive zero marks for whatever reason.
- Exam papers must be submitted in whole and on time in the exam room. Exam papers (a) not submitted on time or (b) submitted with missing pages or (c) submitted elsewhere or (e) not received at all will receive zero marks for whatever reason.

### **3. Fee-Arranged Issues**

Students are responsible for administrative matters concerning their course registration including fee arrangements. No make-up work or remedies will be given for losses of access to LEARN and academic consequences arising from administrative issues with the Registrar's Office.

### **4. Classroom Protocols**

- Turn off all handheld devices and put them away for the duration of the lecture. Laptop computers may only be used to view lecture material. Off-task use (e.g., Facebook, texting, other) will result in your device being confiscated for the class and/or being asked to leave the classroom for all or part of the class or course.
- Photographic devices are not permitted in class due to copyright and privacy issues.
- In order to maintain a learning environment in this classroom, the highest level of courtesy and professional behaviour is expected from every student.

## **University Statements**

### **1. Cross-Listed Courses**

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.

### **2. Academic Integrity**

**Academic Integrity:** In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility.

**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, <http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm>

**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, <http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm>

**Appeals:** A student may appeal the finding and/or penalty in a decision made under Policy 70 – Student Petitions and Grievances (other than regarding a petition) or Policy 71 – Student Discipline if a ground for an appeal can be established. Read Policy 72 – Student Appeals, <http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm>

Academic Integrity website (Arts):

[http://arts.uwaterloo.ca/arts/ugrad/academic\\_responsibility.html](http://arts.uwaterloo.ca/arts/ugrad/academic_responsibility.html)

Academic Integrity Office (University): <http://uwaterloo.ca/academicintegrity/>

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

The AccessAbility Services (AS) Office, located in Needles Hall, Room 1132, 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.