Economics 454
Benefit-Cost Analysis
Autumn 2019
Professor Robert Halvorsen

Benefit-cost analysis is a widely applied method for evaluating government projects, policies, and regulations. This course reviews the theoretical foundations of benefit-cost analysis and derives formulas and procedures for the monetization of benefits and costs, aggregation over time, valuation of uncertain benefits and costs, and aggregation over individuals. By the end of the course, students should have a firm understanding of the issues, techniques, and practical difficulties involved in benefit-cost analysis and the ability to critique real-life benefit-cost analyses.

The prerequisite for this course is ECON 300 and the class discussions will assume that students have a solid understanding of intermediate level microeconomics. Two, non-cumulative, exams will count for 70% of the course grade, with the (curved) grade for the exam on which you do better receiving a weight of 0.7 in calculating the overall exam grade and the exam on which you do less well receiving a weight of 0.3. Last Quarter's exams are posted on Canvas as a preview of the types of questions that will be asked as well as sources of practice questions in studying for this Quarter's exams.

Six quizzes will account for 20% of the course grade. The quiz on which you do least well will not be included in calculating the overall quiz grade.
Please refer to the next page for very important information on the rules for taking exams and quizzes. Note especially the information concerning cell phones.

Eight problem sets will account for 10% of the course grade. Your answers will be collected in class. They do not need to be typed but do need to be legible. Detailed answer sheets will be posted for the problem sets and quizzes. Reviewing the answers and comparing them to your own are excellent ways to learn the course material.

There is no textbook or course pack for this course. Lecture notes on the topics expected to be covered in class are posted on Canvas. The actual lectures given in class will not necessarily be identical to the posted notes. Problem sets and answers to problem sets and quizzes will also be posted.

My office hours during the Autumn Quarter are 10:00-11:00 on Monday, Tuesday, and Friday in Savery 351. An appointment to meet at another mutually convenient time can be made in person after class or by email at halvor@uw.edu. You can also use email to ask any short-answer questions that may arise as you review your notes or work on the problem sets.

Exam Rules

I Exam Absence Policy

1. If you are unable to make it to an exam period due to illness or another unexpected happening, do the following:

   i.   Notify me no later than the time of the exam that you are not able to take the exam and why.

   ii.   If you missed the exam for health reasons, you need to show me a note issued by a medical professional documenting the reason you missed the exam.

   iii. If there was some other reason for missing the exam, come and see me to explain the reason. You will need to show appropriate documentation. Not waking up or missing your bus/plane is not an acceptable excuse.

2. If you know that you are going to be away due to a University-related activity, such as participation in an away sport or debate, let me know well in advance so that arrangements can be made.

II Exam Taking Rules

1. Material allowed during an exam.

   i. You must bring a large bluebook with nothing written on it.

   ii. All books, papers, notebooks, etc., must be placed inside your backpack or other type of bag, which must be securely and fully closed. If you do not have a bag, you must place all your material out of your reach.

   iii. No electronic devices, including calculators, can be accessible during the exam. Cell phones must be turned off and placed in your closed bag (not in your pocket). **If your cell phone is observed at any point during the exam, your exam will be taken away and assigned a grade of zero.**

   iv. Baseball caps and any other kinds of headgear that conceal your eyes are not permitted.

2. Attendance and special accommodation

   i. You are not allowed to leave the room during the exam. This includes restroom use; be sure to use the restroom before the beginning of the exam.

   ii. If you arrive late to an exam, you cannot expect to get extra time after the official end of the exam to make up for the missing time at the beginning.

   iii. If you have a documented disability, please show me documentation from the Office of Disability Resources for Students on the first day of class, so that I can make any arrangements required for accommodations.

III Academic Integrity

1. Exams are individual work and cheating will not be tolerated. Looking at notes or your neighbors' answers will result in the immediate termination of your exam time and a grade of zero for the exam.

2. Altering an exam before submitting it for a review of the grading, obtaining an advance copy of an examination, or arranging for a surrogate test-taker are all flagrant violations of University policy.

3. Cheating of any kind may result in expulsion from the University. The Department will follow University policy in case of academic misconduct. I strongly recommend that you review University policy at http://www.washington.edu/uaa/advising/help/academicintegrity.php. Students found to have engaged in academic dishonesty will be subject to sanctions, which range from a disciplinary warning to permanent expulsion from the University, depending on the seriousness of the misconduct.

Course Schedule
All dates except for the final exam are subject to revision.

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy (https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form (https://registrar.washington.edu/students/religious-accommodations-request/).

September 25th

Introduction
Benefit-cost analysis as four-way aggregation
Standing
Social welfare

September 30th

Evaluation criteria
Social welfare criterion
Pareto criterion
Potential compensation criterion

October 2nd   Problem Set 1 Due

Aggregation over commodities
Valuation principles
Valuation of inputs and outputs in undistorted, perfectly competitive, markets

October 7th   Quiz 1

Valuation of inputs and outputs when markets are not used or are distorted
Mandatory acquisition of inputs
Price controls

October 9th   Problem Set 2 Due

Aggregation over Time
Basic principles
Dynamic efficiency
Present value of consumption criterion
Capital markets and dynamic efficiency

October 14th   Quiz 2

Net present value decision rules
Continuous discounting
Special cases of discounting formulas

October 16th   Problem Set 3 Due

Benefit-cost ratio decision rules
Internal rate of return decision rules

October 2st Quiz 3

Dynamic inefficiency
Social value of private investment
Net social benefit formula

October 23rd Problem Set 4 Due

Aggregation over States of the World
Expected monetary value (EMV)
Certainty equivalent (CE)
Risk aversion
Expected utility

October 28th REVIEW FOR MIDTERM EXAM

October 30th MIDTERM EXAM

November 4th

Gambles vs. insurance
EMV as approximation of CE

November 6th Problem Set 5 Due

Aggregation over Individuals

Methods using explicit distributional weights

November 11th VETERANS DAY

November 13th Quiz 4

Methods not using explicit distributional weights

November 18th Problem Set 6 Due

Valuation of Commodities with Incomplete Market Data
Limited observations on price and quantity
Cost of alternative supply
Use of market data for related commodities

November 20th Quiz 5

Valuation of Commodities for Which Market Data Are Nonexistent
Travel cost technique
Valuation of risks to life

November 25th Problem Set 7 Due

Value of a statistical life
Factors affecting the value of a statistical life

Risk-risk analysis

November 27th

Stated preference method

December 2nd   **REVIEW FOR FINAL EXAM**
                                 Problem Set 8 due

December 4th   **FINAL EXAM COVERS MATERIAL SINCE MIDTERM EXAM**