Instructor Information

- Alexander Heil, PhD
- Email: ah5701@nyu.edu
- Phone: 347-616-9039
- Office Hours: By Appointment only

Course Information

- Class Meeting Times: Wednesdays; 6:45-8:25pm
- Class Location: 194 Mercer St Room 307 Loc: Washington Square

Course Prerequisites

CORE-GP 1021, CORE-GP 1018, and CORE-GP 1011 are prerequisites. Microeconomics provides the foundation for cost-benefit analysis, and consequently the course assumes a basic background in microeconomics at the level of 1018 or higher. Students who have only taken 1018 and received a grade lower than a B may register but should expect to spend extra time learning the underlying microeconomic principles and tools.

Course Description

Cost-benefit analysis (CBA) involves the use of microeconomics to formally assess the costs and benefits of different projects or investments. CBA is required for major regulations in the United States and is frequently used as a key input into major policy decisions. Understanding its advantages and limitations, and being able to distinguish well-conducted from poor analyses, is an important skill for a policy analyst. This course provides you with the conceptual foundations and practical knowledge you will need to both conduct CBA as well as be a more thoughtful consumer of policy research. The course draws on a mixture of economic theory and real-life case studies to examine both the theoretical and practical issues involved in CBA.
Course and Learning Objectives

1. Understand the economic concepts that provide the foundation for cost-benefit analysis.
2. Learn the practical steps involved in conducting CBA.
3. Develop a set of analytical tools that can be applied to decision-making, including impact analysis, Monte Carlo simulation, sensitivity analysis, and valuation.
4. Become a more critical consumer of policy research and analysis.

Required Readings

The textbook for this course is: Boardman et. al, Cost-Benefit Analysis, Fifth Edition (2019), Cambridge University Press. I am referring to this textbook as “BM”. You may use another edition of the textbook, though I caution you that some material has changed. There will be several other materials, ranging from lecture notes/slides to peer-reviewed academic papers to news articles, to brief excerpts from other books. All of those will be available online via the course website.

Assessment Assignments and Evaluation

Attendance & Participation

Regular attendance and active participation in class are required. Students are expected to have done the readings for each lecture before class. Participation will account for 10% of the final grade. Students will be required to contribute to class discussions. Contributing to class discussions means enhancing the quality of the class experience for yourself and others. It involves making relevant, useful, and non-obvious comments, or posing pertinent questions, in clear and succinct language.

You can utilize the discussion forum feature in Brightspace to communicate with your group members about the project that you are working on. In addition, you can utilize a discussion thread to exchange information, post comments, and ask questions involving everyone else. However, there is no explicit graded component to Brightspace discussion.

5-Minute Presentation & response

You are required to provide a 5-minute presentation on a topic related to cost-benefit analysis. This presentation is supposed to contain a maximum of five PowerPoint slides accompanied by an audio file both of which will be uploaded to Brightspace, not personally presented in class. In addition, you need to respond via Brightspace to another student’s presentation and provide some critical feedback and comments, potentially sparking a discussion of that topic among a wider group.

Group Project

You will be assigned to a group by week 3 of this course. Preferences can be expressed if you have any other individuals that you desire to team up with. Please see me before making a final decision about your project and confirm that it is feasible for the project. There are four deliverables that are part of the group project:
1. **Project Selection & Background:** Each group will provide a short memo [2-3 pages] outlining the selected project and the project’s background [energy, water, transportation etc]. This memo is worth 5% of the total grade.

2. **Project Methodology & Data Needs:** Each group will submit a short memo [2-3 pages] outlining the methodologies likely to be used for the CBA as well as the necessary data. I regard this memo as a work-in-progress deliverable and that changes will likely be made before the completion of the project. This memo is worth 10% of the total grade.

3. **Presentation:** Specific requirements for the presentation [length, number of slides etc] will be provided on Brightspace. The presentation is worth 10% of the total grade.

4. **Project paper:** Each group will compose a paper that outlines and discusses the CBA. The paper will be 10-15 pages in length and include a detailed discussion of the data, assumptions, analysis, and findings of your work. Any Excel calculations need to be included as an appendix, and the Excel file also needs to be submitted electronically. Further details will be provided in class. The paper is worth 25% of the total grade.

**Exams**
There is one midterm exam (15% of the final grade) and a final exam (15% of the final grade). The final exam will be given during the designated finals week at the end of the semester.

**Evaluation/Grading**

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<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Attendance &amp; Participation</td>
<td>10%</td>
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<tr>
<td>5-minute Presentation &amp; response</td>
<td>10%</td>
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<td>Midterm Exam</td>
<td>15%</td>
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<tr>
<td>Group Project Selection &amp; Background</td>
<td>5%</td>
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<tr>
<td>Group Project Methodology &amp; Data Needs</td>
<td>5%</td>
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<td>Group Presentation</td>
<td>10%</td>
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<td>Group Paper</td>
<td>30%</td>
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<td>Final Exam</td>
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<td><strong>TOTAL</strong></td>
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Late assignment penalty: Students are expected to submit all their work on time and via Brightspace. There will be a 10% grade deduction for all work submitted late.

**Course Schedule/Course Calendar**

Most readings will be posted as pdf files in the weekly folders. Some changes to these anticipated readings or the course schedule in general might be made based on student interest and course progress.

General useful resources [there are many more]:
US DOT CBA Guidance for discretionary grant projects:
US Army Cost-Benefit Analysis Guide:

## Course Overview

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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Class topics</th>
<th>Assignments</th>
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<tr>
<td>1</td>
<td>January 24</td>
<td>Introduction &amp; Overview</td>
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<td>2</td>
<td>January 31</td>
<td>Micro review</td>
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<td></td>
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<td>Case: ADHS</td>
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<td>3</td>
<td>February 7</td>
<td>Valuations</td>
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<td>Cases: Green roof &amp; plastic bag ban</td>
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<td>4</td>
<td>February 17</td>
<td>Valuations [cont]</td>
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<td>Case: Heathrow Airport</td>
<td>First group memo [Background &amp; scope]</td>
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<td>5</td>
<td>February 21</td>
<td>CV</td>
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<td>Cases: Water and Wastewater, Bubble curtain</td>
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<td>6</td>
<td>February 28</td>
<td>PV &amp; discounting</td>
<td>Second group memo [Data needs]</td>
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<td>Cases: BRT &amp; BART</td>
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<td>7</td>
<td>March 6</td>
<td>SDR</td>
<td>Individual short presentation</td>
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<td>Case: Storm Surge Barrier</td>
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<td>8</td>
<td>March 13</td>
<td>Uncertainty</td>
<td>Midterm exam</td>
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<td>Cases: Three Gorges Dam, Smart Grid, Vaccinations</td>
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<td>March 20</td>
<td>SPRING BREAK</td>
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<td>9</td>
<td>March 27</td>
<td>Critiques of CBA</td>
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<td>Cases: Malawi internet &amp; Bayonne Bridge</td>
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<td>10</td>
<td>April 3</td>
<td>Other analyses</td>
<td>Response to individual presentation</td>
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<td>Case: HSR</td>
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<td>11</td>
<td>April 10</td>
<td>Summary</td>
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<td></td>
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<td>Cases: Bees &amp; Wastewater reclamation</td>
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<td>12</td>
<td>April 17</td>
<td>Discussion of topics</td>
<td>Group presentations</td>
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<tr>
<td>13</td>
<td>April 24</td>
<td>Discussion of topics</td>
<td>Group presentations</td>
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<td>14</td>
<td>May 1</td>
<td>Discussion of topics</td>
<td>Group presentations Group paper</td>
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<td>TBD</td>
<td>FINAL EXAM</td>
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Detailed Course Overview

Session 1                                                                                 January 24
Topic:  Course Overview & Introduction
       Economic Terminology

Required Readings:
- BM 1 & 2
- European Commission Guide to Cost-Benefit Analysis of Investment Projects
  Economic appraisal tool for Cohesion Policy 2014-2020, December 2014. [This
  publication is a good general resource that will be useful throughout the entire course
  and beyond.]
- Richard O. Zerbe and Tyler Scott, A Primer for Understanding Benefit-Cost Analysis,
  Benefit-Cost Analysis Center, The Daniel J. Evans School of Public Affairs, University
  of Washington

Session 2                                                                                 January 31
Topic:  Economic Principles/Review of Microeconomics
Case Study:  Road Transportation: Completion of the Appalachian Development Highway System

Required Readings:
- You may want to consult a standard microeconomics text [I will provide an electronic
  version of the Mankiw textbook.].
- BM 3
- Website maintained by Transportation Economics Committee at the Transportation
  Research Board: Cost-Benefit Analysis
  https://sites.google.com/site/benefitcostanalysis/ [There is a lot of excellent material
  here including links to tools and studies. Exploring this resource will be helpful for
  some of the other topics covered in this course.]
- Cambridge Systematics, Economic Impact Study of Completing the Appalachian
  Development Highway System Final Report, June 2008

Session 3                                                                                 February 7
Topic:  Valuation of Benefits
       Overview of Benefits Methodologies
       Experiments
Case Study:  Environmental Investment: Green Roof Infrastructure
       Environmental Policy: Plastic Bag Ban

Required Readings:
- BM 11 & 12
- General Services Administration, Green roof benefits and challenges cost benefit
  analysis, Chapter 3, Page 67.
- Tomalty, Ray, Bartek Komorowski and Dany Doiron The Monetary Value of the Soft
  Benefits of Green Roofs Report prepared for Canada Mortgage and Housing
  Corporation, 2010.
- Marsden Jacobs Associates Plastic Bags Ban Options – Cost Benefit Analysis Report
  prepared for the Victorian Department of Environment, Land, Water and Planning,
  NOVEMBER 2016
Session 4  February 17

Topic: Valuation of Benefits [continued]
Direct estimation of demand curves
Indirect Market Methods

Case Study: Aviation: Heathrow Airport Expansion

Required Readings:
- BM 4, 13 & 14
- UK House of Commons, Expansion of Heathrow Airport, Research paper, 09/11 4 February 2009.

Assignment Due: Project Selection & Background Memo

Session 5  February 21

Topic: Valuation of Benefits [continued]
Contingent Valuation
Shadow prices

Case Study: Water & Sanitation: Global Water & Sanitation Investments
Climate Change Mitigation: Hurricane Bubble Curtain

Required Readings:
- BM 15, 16 & 17

Session 6  February 28

Topic: Valuation of Benefits [continued]
Contingent Valuation
Present Value & Discounting

Case Study: Transit: Bus Rapid Transit Systems & Expansion of Bay Area Rapid Transit

Vehicle transportation: Vehicle mileage standards

Required Readings:
- BM 6 & 10
Session 7
March 6

Assignment Due: Project Methodology & Data Needs Memo

Topic: Present Value & Discounting [continued]
Social Discount Rate

Case Study: Climate Change Investment: Storm Surge Barrier for New York City

Required Readings:
- BM 6 & 10

• Assignment Due: Short individual presentation

Session 8
March 13

Assignment Due: Midterm Exam

Session 9
March 27

Assignment Due: Midterm Exam
Technology: Investment in internet connectivity in Malawi

Required Readings:
- BM 20

Session 10  
**April 3**

**Topic:** Other types of analysis  
Economic Impact Analysis  
Financial cost-benefit analysis  
Cost effectiveness analysis  
Lifecycle cost analysis

**Case Study:** Passenger Rail: High speed rail in California

**Required Readings:**
- BM 18

• **Assignment Due:** Response to short individual presentation

Session 11  
**April 10**

**Topic:** Course summary & review

**Case Study:** **Ecosystem Services: Bees, Wastewater reclamation**
- Food and Agriculture Organization of the United Nations *Economic Valuation of Pollination Services: Review of Methods* 2006

Session 12  
**April 17**

**Topic:** Peer review & discussion of student topics & projects

**Assignments Due:** Group Presentations
Session 13          April 24
Topic:              Peer review & discussion of student topics & projects
Assignments Due:   Group Presentations

Session 14          May 1
Topic:              Peer review & discussion of student topics & projects
Assignments Due:   Group Presentations
                    Group Project Paper
                    Final Exam (exact due date TBD)

NYU Brightspace
All announcements, resources, and assignments will be delivered through the NYU Brightspace site.

Academic Integrity
Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by Wagner’s Academic Code. All Wagner students have already read and signed the Wagner Academic Oath. Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

Policy on the Use of Generative AI
Use of ChatGPT and related tools is allowed in this class, but needs to be documented and properly cited. (Taking credit for writing you did not create is a violation of NYU’s Academic Integrity policy.) As with all assignments, learning from the work is your responsibility. You must use the tools in a way that involves effort you learn from.

In case of using ChatGPT or other LLM, for every assignment, you should also turn in a description of:

- Which tools and techniques you used (Include your prompts, any plugins you used, etc.)
- Which parts of the assignment you used them for
- What you think you learned from the work you did, and why you think that matches the goals of the assignment

Be prepared to discuss your answers in class, or in conversation with me. I reserve the right to orally test the content of an assignment or section of the course and adjust grades accordingly if there is a meaningful difference between the quality of an assignment and the oral exam.
Henry and Lucy Moses Center for Students with Disabilities at NYU

Academic accommodations are available for students with disabilities. Please visit the Moses Center for Students with Disabilities (CSD) website and click on the Reasonable Accommodations and How to Register tab, or call or email CSD at (212) 998-4980 or mosescsd@nyu.edu for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU’s Calendar Policy on Religious Holidays

NYU's Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.