

O'Neill School of Public and Environmental Affairs

P541 Benefit Cost Analysis

Fall 2024

Course Details

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Office Hours: By appointment: [Zoom](#).

Class Meetings: MW 3:00-4:15 Pm, PV 272

Course Description

A course applying benefit-cost analysis to public and environmental policies. The first part of the course develops the conceptual foundations. The second part of the course applies the methods to practice and further develops topics on benefit valuation and political economy.

Learning Outcomes

P541 has two overarching objectives. The first is to introduce the conceptual framework underlying benefit-cost analysis, and to provide the opportunity to apply it. You will learn the analytic techniques of benefit-cost analysis through application-oriented assignments that give practice using the method. The second is to develop the methodological sophistication and philosophic perspective needed to understand the information that benefit-cost analysis provides. You will come to understand both the value and limitations of your own work as a BCA practitioner, and become a sophisticated consumer of benefit-cost analyses produced by government agencies, non-profits, and others.

O'Neill School and IU Policies and Expectations

O'Neill School Expectations of Civility and Professional Conduct

The O'Neill School takes matters of honesty and integrity seriously because O'Neill is the training ground for future leaders in government, civic organizations, health organizations, and other institutions charged with providing resources for the public, and for members of society who are vulnerable and who are lacking in power and status. Precisely because O'Neill graduates tend to rise to positions of power and responsibility, it is critical that the lessons of honesty and integrity are learned early.

O'Neill requires that all members of its community – students, faculty, and staff – treat others with an attitude of mutual respect both in the classroom and during all academic and nonacademic activities outside the classroom. A student is expected to show respect through behavior that promotes conditions in which all students can learn without interruption or distraction.

Academic Integrity

Note Selling: Several commercial services have approached students regarding selling class notes/study guides to their classmates. Selling the instructor's notes/study guides in this course is not permitted. Violations of this policy will be reported to the Dean of Students as academic misconduct (violation of course rules). Sanctions for academic misconduct may include a failing grade on the assignment for which the notes/study guides are being sold, a reduction in your final course grade, or a failing grade in the course, among other possibilities. Additionally, you should know that selling a faculty member's notes/study guides individually or on behalf of one of these services using IU email, or via Canvas may also constitute a violation of IU information technology and IU intellectual property policies; additional consequences may result.

Online Course Materials: The faculty member teaching this course holds the exclusive right to distribute, modify, post, and reproduce course materials, including all written materials, study guides, lectures, assignments, exercises, and exams. While you are permitted to take notes on the online materials and lectures posted for this course for your personal use, you are not permitted to re-post in another forum, distribute, or reproduce content from this course without the express written permission of the faculty member. Any violation of this course rule will be reported to the appropriate university offices and officials, including to the Dean of Students as academic misconduct.

Summary Suspension Policy

"A student may be summarily suspended from the university and summarily excluded from university property and programs by the Provost or designee of a university campus. The Provost or designee may

act summarily without following the hearing procedures established by this section if the officer is satisfied that the student's continued presence on the campus constitutes a serious threat of harm to the student or to any other person on the campus or to the property of the university or property of other persons on the university campus."

The Provost has determined that refusal to comply with the public health requirements specified in the Student Commitment form, including the requirement of wearing a mask in all IU buildings, constitutes "a serious threat of harm to other persons" within the meaning of the summary suspension policy. In addition, the Provost has determined that a person who does not comply with these requirements, as evidenced by three credible violations of the policy reported to the campus from any source, constitutes "a serious threat of harm to other persons" within the meaning of the summary suspension policy.

Student Rights

Any student who believes another person in a class is threatening the safety of the class by not wearing a mask or observing physical distancing requirements may leave the class without consequence.

Attendance

Regular class attendance is the best way to learn the course material. Please let the instructor know of any physical health, mental health, or other circumstances that would justify missing a class.

Additional Information for Students

Counseling and Psychological Services

For information about services offered to students by
CAPS: <http://healthcenter.indiana.edu/counseling/index.shtml>.

Religious Observation

In accordance with the Office of the Dean of Faculties, any student who wishes to receive an excused absence from class must submit a request form available from the Dean of Faculties for each day to be absent. This form must be presented to the course instructor by the end of the second week of this semester. A separate form must be submitted for each day. The instructor will fill in the bottom section of the form and then return the original to the student. Information about the policy on religious observation can be found at the following website: <https://policies.iu.edu/policies/aca-59-accommodation-religious-observances/index.html>.

Accessible Educational Services

Securing accommodations for a students in need of accessible educational services, such as students with disabilities, is a responsibility shared by the student, the instructor and the AES Office. For information about available support services or accommodations, and for the procedures to be followed by students and instructors, see <https://studentaffairs.indiana.edu/student-support/disability-services/index.html>.

Sexual Harassment

As your instructor, one of my responsibilities is to help create a safe learning environment on our campus. Title IX and our own Sexual Misconduct policy prohibit sexual misconduct. If you have experienced sexual misconduct, or know someone who has, the University can help.

If you are seeking help and would like to talk to someone confidentially, you can make an appointment with:

1. The Sexual Assault Crisis Service (SACS) at 812-855-8900
2. Counseling and Psychological Services (CAPS) at 812-855-5711
3. Confidential Victim Advocates (CVA) at 812-856-2469
4. IU Health Center at 812-855-4011

For more information about available resources: <http://stopsexualviolence.iu.edu/help/index.html>. It is also important to know that federal regulations and University policy require me to promptly convey any information about potential sexual misconduct known to me to our campus' Deputy Title IX Coordinator or IU's Title IX Coordinator. In that event, they will work with a small number of others on campus to ensure that appropriate measures are taken and resources are made available to the student who may have been harmed. Protecting a student's privacy is of utmost concern, and all involved will only share information with those that need to know to ensure the University can respond and assist. I encourage you to visit <http://stopsexualviolence.iu.edu/help/index.html> to learn more.

Commitment to Diversity: Find your Home and Community at IU

Asian Culture Center

Address: 807 East Tenth Street, Bloomington, IN 47408

Phone: 812-856-5361

Email: acc@indiana.edu

Website: <https://asianresource.indiana.edu/index.html>

First Nations Educational & Cultural Center

Address: 712 E 8th St., Bloomington, IN 47408

Phone: 812-855-4814

Email: fnecc@indiana.edu

Website: <https://firstnations.indiana.edu/contact/index.html>

LGBTQ+ Culture Center

Address: 705 E 7th St., Bloomington, Indiana 47408

Phone: 812-855-4252

Email: gltbserv@indiana.edu

Website: <https://lgbtq.indiana.edu/contact/index.html>

La Casa Latino Culture Center

Address: 715 E 7th St., Bloomington IN, 47408

Phone: 812-855-0174

Email: lacasa@indiana.edu

Website: <https://lacasa.indiana.edu/>

Neal Marshall Black Culture Center

Address: 275 N Jordan Ave Bloomington, Indiana 47405

Phone: 812-855-9271

Email: nmgrad@indiana.edu; Website: <https://blackculture.indiana.edu/index.html>

Course Information

Overview

Welcome to Benefit-Cost Analysis (BCA). This course develops an economic framework for thinking analytically about public decision-making. You will learn the principles of microeconomics-based policy evaluation, and how to structure, conduct, and interpret benefit-cost analyses.

The BCA framework presumes that resources (such as labor, capital, energy, and natural environments) are relatively scarce, and therefore, that the use of resources should be economized. Economizing might mean allocating resources to minimize the cost of achieving a policy goal like reducing air pollution, or allocating a given amount of a scarce good like water to users who value it the most -- maximizing the economic value of the water. The economizing framework also recognizes that increasing the supply of a public good like health care reduces resources available to supply other public or private goods and services, like environmental quality or education. The benefit-cost principle says that resources should be diverted from producing other goods and services into producing healthcare only if the value of the

resources in healthcare is higher than their “opportunity cost” -- the value of the resources in the “next best” alternative given up to produce the healthcare.

[The implication of opportunity cost is: “since you can’t have everything, choose carefully!”](#) The purpose of benefit-cost analysis is to help public decision-makers choose carefully in a world of limited resources.

Choosing public policies carefully has both philosophic and economic dimensions. An important philosophic issue arises from a structural characteristic of public goods; namely, that everyone consumes the same level. Thus, a policy to increase a public good like “national defense” will be favored by those who want more and opposed by those who want less. More generally, the policymaking process gives everyone the same public project or policy, producing winners and losers. In contrast, the market process supplying private goods allows consumers to buy as much or little of a good as they choose.

There is not a philosophically “correct” way to aggregate the wins and losses arising from public policy, and many ways to do it. For example, majority voting combines win-loss distributions differently than the standard used in benefit-cost analysis. This difference implies that a majority of voters might not support a policy that passes a benefit-cost test -- and vice versa. The differences in the ways that preferences are combined in the political arena and the method used in benefit-cost analysis will be explored in a later course module.

Class Modules

The course is divided into the following modules, with class periods distributed as shown:

Module	Topic	Weeks	Dates
1	Introduction/Core Elements/Microeconomics Review	1-3	M 8/26- S 9/15
2	BCA Accounting Framework	4	M 9/16- S 9/22
3	Investment Analysis	5-6	M 9/23 - S 10/6
4	BCA Extensions and Applications	7-10	M 10/7- S 11/3
5	Benefit Valuation	11-12	M 11/4- W 11/13
6	Distribution and Politics	12-13	Th 11/14 - 11/24
7	Final Paper	14-15	M 12/2 - S 12/15

Technical Note: if the link doesn’t open, right click, then left click on “copy hyperlink”, and then paste the copied hyperlink into your browser.

Module 1 introduces the course and reviews microeconomic theory, emphasizing the relevance of microeconomics to the BCA framework.

Module 2 introduces the fundamental concepts underlying benefit-cost analysis and develops the Kaldor-Hicks Tableau format for distributional accounting.

Module 3 covers the fundamentals of intertemporal decision-making -- the defining characteristic of investment analysis.

Module 4 expands upon previous material, covering the specification of baselines and alternative comparisons, uncertainty analysis using Monte Carlo simulation, Cost-Effectiveness Analysis, and Shadow-Pricing.

Module 5 focuses on the theory of benefit measurement and the empirical methods used for eliciting valuations of public goods lacking market prices.

Module 6 reviews normative issues associated with the BCA decision-criterion and explores the political and distributional issues associated with the BCA in practice.

Module 7 is a period for finishing up final papers.

Assignments

Each course module offers notes/instructional videos that I have written/produced and journal articles and/or government reports. Every module is followed by a method for assessing knowledge and providing practice at analysis and problem-solving. These assessments are posted at the designated assignment tabs on the Canvas course page. Several of the modules have a two-part assessment that consists of (a) discussion questions about readings, and (b) problem sets or case assignments. The first three modules rely on problem sets for the Part (b) assessments. The last three modules rely on one case assignment, the Worker Training Case, and your responses to a more detailed set of questions on the material for Modules 5 and 6.

A critical part of the course is a final paper assignment. This assignment allows you to apply the concepts and methods developed in class to an area of your professional interest.

Graded assignments are based on the following:

Module	Assignment	% of Final Grade	Due Date
	Abstract for Final Paper	-	S 10/13
1	A1 _a Concepts in Readings and Notes: Quiz 1	4%	S 9/15
	A1 _b Problems and Solutions: Problem Set 1	5%	S 9/15
2	A2 _a Concepts in Readings and Notes: Quiz 2	2%	S 9/22

	A2 _b Problems and Solutions: Problem Set 2	5%	S 9/22
3	A3 Problems and Solutions: Problem Set 3	10%	S 10/6
4	A4 _a Concepts in Readings and Notes: Quiz 3	4%	S 10/20
	A4 _b Case 1: Benefit-Cost Analysis of a Worker Training Program	15%	S 11/3
5	A5 Benefit Valuation Review	10%	S 11/17
6	A6 Distribution and BCA Review	10%	S 11/24
7	Final Paper	35%	W 12/18
		100%	

Ground Rules for the Assignments

1. Quizzes. You should do quizzes 1-4 individually.
2. Problems Sets 1-3. You can work on these problem sets in groups of up to 3 people, with the proviso that all group members work on all questions together. One member of the group should post the assignment with the names of all group members.
3. Case 1: You can work in groups of up to 3 people for the analysis part of the case. Everybody in the group should discuss the computations and work together. For the memo part of the case, you should write your own memo individually and post it under your name on the relevant assignment tab.
4. Detailed Questions for Modules 5 and 6. You can work on these questions in groups up to 3, with the proviso that all group members work on all questions together.
5. Final Papers. Final papers can be completed individually, or you can work on a final paper in groups up to 3. See below for further details.

Assignments up to three days late will lose a half a letter grade. Assignments from 4-7 days late will be debited a full letter grade. Assignments more than a week late will not be accepted without a discussion in advance.

Final Papers

The final paper is due **Wednesday 12/18**. You should begin thinking about your paper as soon as possible, and feel free to exchange with me about it. An abstract, **with the paper's title**, is due **Sunday 10/13**. The abstract should provide one or two paragraphs that summarize your paper idea. You can provide several paper ideas, if you want feedback about alternative topics.

The final paper can be on any subject related to cost-effectiveness analysis or benefit-cost analysis. But **pick a topic that complements and supports your career interests**. In the past, students have used final papers writing/research examples in employment or PhD applications.

The link [Final Paper](#) gives example final papers that have been completed in past classes, types of final papers and general background, information about sources, and guidelines for writing the final paper.

Using AI for final Paper Assignments. You should **not use** AI-identified summaries in your final paper. This is plagiarism, and subject to IU's plagiarism penalties. Moreover, it is relatively easy to identify AI-generated content for a technical subject like BCA.

When used carefully, AI can serve as a useful research assistant for tracking down sources and information. However, I have found from personal experience that AI can turn up non-existent sources and factually incorrect "information." All sources need to be located and verified. Sources appropriate for final papers include academic journal articles, government documents, technical reports, and the like, which can be downloaded, read, and cited just like any source you would have located in the pre-AI era.

Grading Scale

Grade	Raw Score
A	93-100
A-	87-92
B+	82-86
B	75-81
B-	69-74
C+	62-68
C	55-61
C-	50-54
D+	40-49
D	30-39
D-	20-29
F	< 20

The grading standard for PhD students will be appropriately more stringent than for master students, and the final paper requirement more substantial (Discussed in [Final Paper](#)).

Class Schedule

A class schedule is shown below. It is important to keep current with the reading material week by week, and to turn in assignments on schedule, if at all possible. It is difficult to recover in this course if you get too far behind.

Module	Week	Date	Class Topic	Assignment Due Dates
1: Introduction/Core Elements/Microeconomics Review	1	M 8/26 - S 9/1	Course Overview/Core BCA Elements	
	2	M 9/2 - S 9/8	Microeconomics Review	
	3	M 9/9 - S 9/15	Problem Set 1	
		S 9/15	Problem Set 1 and Quiz 1 Due	A1_a & A1_b
2: BCA Accounting Framework	4	M 9/16- S 9/22	BCA Accounting Framework/ Problem Set 2	
		S 9/22	Problem Set 2 and Quiz 2 Due	A2_a & A2_b
3: Investment Analysis	5	M 9/23- S 9/29	Introduction to Investment Analysis	
	6	M 9/30 - S 10/6	Annualizing Formulae and the Cost of Capital/ Spreadsheet Application and Inflation/Alternative Investment Criteria	
		S 10/6	Finance Problem Set Due	A3 Due
4: BCA Extensions and Applications	7	M 10/7 - W 10/13	Final Points on Discounting. Baselines, Policy Objectives and Alternative/ Cost-Effectiveness Analysis	

		S 10/13		Final Paper Abstract Due
	8	W 10/14 - S 10/20	Shadow Pricing/Social Discount Rate/ Uncertainty Evaluation	
		S 10/20	Quiz 3 Due	A4a
	9	M 10/21 – S 10/27	Cincinnati Vehicle Emissions Case Worker Training Case	
	10	M 10/28 – S 11/3	Worker Training Case	
		S 11/3	Worker Training Case Due	A4_b
5. Benefit Valuation	11	M 11/4 – 11/10	Benefit Valuation	
	12	M 11/11- W 11/13	Benefit Valuation	
		S 11/12	Benefit Valuation Review – Due	A5
6: Distribution and Politics		Th 11/14 – S 11/17	Distribution and BCA – Normative Aspects	
	13	M 11/18 – S 11/24	Distribution and BCA – Positive Aspects	
		S 11/24	Distribution and BCA Review -Due	A6
Thanksgiving Break				
7. Final Paper	14	M 12/2 – S 12/8	Unscheduled time to finish up final papers	

	15	M 12/9- S 12/15	Unscheduled time to finish up final Papers	
		W 12/18	Final Paper Due	

It is important to begin your final paper early and work on your paper along with other assignments as the courses progresses. Again, an abstract for the final paper is due Sunday **2/18**.

Readings

Module 1: BCA Introduction/Core Elements/Microeconomics Review

1. KK. The Development and Application of BCA Analysis.
2. KK. Core Elements.
3. KK. Microeconomics Review.
4. Viscusi, W. (2006). Monetizing the benefits of risk and environmental regulation. Fordham Urban Law Journal 33(4), 1003-1044.

Module 2: BCA Accounting Framework

1. KK. Lecture Notes.
2. Howe, C. W. (1987). Project benefits and costs from national and regional viewpoints: methodological issues and case study of the Colorado-Big Thompson project. Natural Resources Journal 27, 5.
3. Krutilla, K. (2005). Using the Kaldor-Hicks tableau format for cost-benefit analysis and policy evaluation. Journal of Policy Analysis and Management 24(4), 864-875.
4. Distributional Accounting, (in Teaching BCA), KK

Module 3: Investment Analysis

1. KK. Introduction to Investment Analysis.
2. KK. Inflation Analysis.

3. KK. Alternative Investment Criteria.
4. KK. Cost of Capital/Social Discount Rate.

Module 4: BCA Extensions and Applications

1. KK. Lecture Notes.

Module 5: Benefit Valuation

Required

KK Note on "Benefit Valuation"

Supplemental

1. [OECD, 2018. Cost-Benefit Analysis and the Environment: Further Developments and Policy Use, OECD Publishing, Paris, \)](#)
1. Diamond, P. A., & Hausman, J. A. (1994). Contingent valuation: Is some number better than no number? *The Journal of Economic Perspectives* 8(4), 45-64.
2. Hanemann, W.H. (1994). Valuing the environment through contingent valuation, *Journal of Economic Perspectives* 8(4), 19-43.
3. Portney, P. (1994). The contingent valuation debate: Why economists should care. *Journal of Economic Perspectives* 8(4), 3-17, 1994.
4. Halstead, J. M., Luloff, A. E., & Stevens, T. H. (1992). Protest bidders in contingent valuation. *Northeastern Journal of Agricultural and Resource Economics* 21(2), 160-169.
5. Krutilla, K., & Zerbe, R. (2011). Intangible values in benefit-cost analysis. APPAM Annual Research Conference Washington D.C.
6. Groothuis, P. A., Johnson, B. K., & Whitehead, J. C. (2004). Public funding of professional sports stadiums: Public choice or civic pride? *Eastern Economic Journal*, 515-526.
7. Hoyos, D., Riera, P., Fernández-Macho, J., Gallastegui, C., & Garcia, D. (2012). Valuing environmental impacts of coastal development projects: A choice experiment application in Spain. *Journal of Oceanography and Marine Science* 3(2), 32-40.
8. Alevy, J.E., List, J.A., Adamowicz, W.L. (2011). How can behavioral economics inform nonmarket valuation? An example from the preference reversal literature. *Land Economics* 87 (3), 365–381.

9. Huhtala, A., (1999). How much do money, inconvenience and pollution matter? Analysing households' demand for large-scale recycling and incineration. *Journal of Environmental Management* 55(1): 27-38
10. Coral Reefs: Their Functions, Threats and Economic Value. Herman S.J Cesar. 2002. <http://www.oceandocs.org/handle/1834/557>.
11. A Technical Note on Aircraft Noise and Its Cost to Society. Aleksandra Lazic and Richard Golaszewski. GRA, Incorporated. Economic Counsel to the Transportation Industry. April 19, 2006.

Module 6: Distribution and BCA

Required

KK Note: "BCA and Distribution"

Supplemental

1. Kumar, S. (2002). Does "participation" in common pool resource management help the poor? A social cost-benefit analysis of joint forest management in Jharkhand, India. *World Development* 30(5), 763-782
2. Boardman, A., Vining, A., Waters, W.G. (1993). Costs and benefits through bureaucratic lenses: Example of a highway project, *Journal of Policy Analysis and Management* 12 (3), 532-555.
3. Courant, P. N. (1994). How would you know a good economic development policy if you tripped over one? Hint: don't count the jobs, *National Tax Journal* 47(4), 863-881.
4. Farrow, S. (2013). How (Not) to lie with benefit-cost analysis. *The Economist's Voice* 10(1), 45-50.
5. Kinnaman, T.C. (2011). The economic impact of shale gas extraction: A review of existing studies. *Ecological Economics* 70, 1243-1249.
6. Arbuckle, D. (2011). The role of analysis on the 17 most political acres on the face of the earth. *Risk Analysis* 31(6), 884-892.
7. Leo Dobes (2017). The post-truth era in the government evaluation of major project and policy proposals. Working Paper. Crawford School of Public Policy, Australian National University.

Supplemental Course Readings Materials, Organized by Topic

Public domain guidelines are available covering a number of topical areas, including the following:

Criminal Justice

Cost-Benefit Analysis: A Guide for Drug Courts and Other Criminal Justice Programs. P. Mitchell Downey and John K. Roman. National Institute of Justice, Research in Brief, June 2014.

Education

[Institute for Education Science](#)

[Center for Benefit Cost Analysis in Education](#)

Environment

Guidelines for Preparing Economic Analysis. U.S. Environmental Protection Agency (updated May 2014).

Children's Health Valuation Handbook. US EPA, 10/2003.

[OECD, 2018. Cost-Benefit Analysis and the Environment: Further Developments and Policy Use, OECD Publishing, Paris](#)

[Water Resources](#)

Health Evaluation

Cost of Illness Studies – A Primer. Joel Segel, RTI International

International Guides

Guide to Cost-Benefit Analysis of Investment Projects. European Commission 12/2014.

The Green Book: Appraisal and Evaluation in Central Government. HM Treasury, U.K., 2011.

Guide to Social Cost Benefit Analysis. The Treasury, New Zealand Government, July 2015.

Canadian Cost-Benefit Analysis Guide: Regulatory Proposals. Treasury Board of Canada, Interim, 2007.

Guide to Socioeconomic Evaluation of Public Investments in France

General Guidance for Cost-Benefit Analysis in the Netherlands

International Development

World Bank Handbook on Economic Analysis of Investment Operations. 2001

Cost-Benefit Analysis for Development: A Practical Guide. Asian Development Bank, 2013.

Many others (see folder)

See also: [file repository](#)

IT Evaluation

Cost-Benefit Analysis Guide for NIH IT Projects. Robert Lagas, 10/1998.

Regulatory Impact Analysis

Executive Order 12866 – Regulatory Planning and Review, 9/30/1993.

Economic Analysis of Federal Regulations Under Executive Order 12866, 1/11/1996.

Circular A-4, 9/17/2003.

Executive Order 13563 –Improving Regulation and Regulatory Review, 1/18/2011.

Circular A-4, Regulatory Impact Analysis: A Primer, 2011.

Using Cost-Benefit Analysis to Craft Smart Regulation. A Primer and Key Considerations for Congress and Federal Agencies, 12/2014.

The best generic course supplement is probably the [Canadian Treasury Board BCA Guide](#). You can check out the other posted guides in your interest area, as relevant.