

New York City College of Technology  
Social Science Department

Department of Social Science  
Econ 2505: Environmental Economics  
Class Hours: 3, Credits: 3

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**CATALOG DESCRIPTION:** This interdisciplinary course examines current environmental issues from a macroeconomic perspective, focusing on both the long and short-term economic viability of various proposals to address current environmental challenges. Traditional goals of economic efficiency will be examined in the context of the need to expand renewable energy sources, green design, sustainable construction and resource allocation and other efforts to combat climate change on a global scale.

**Proposed rationale for course:** To help meet the needs of the proposed new four-year degree program in sustainability studies at City Tech, this course seeks to examine sustainability issues from an economic perspective. As many issues, such as investment in renewable energy sources, 'green' building, design, and construction projects and emerging technologies aimed at reducing the carbon footprint are often evaluated in the context of efficiency and economic costs and benefits, this course seeks to examine these concepts from a broader perspective, in which efficient choices are examined in the context of long-term economic and ecological well-being. The course also stands on its own as an important addition to the offerings in the Economics discipline, particularly as issues of sustainable economic practices become more central to thinking about solutions to macroeconomic problems.

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**COURSE PREREQUISITE:**

CUNY proficiency in reading and writing and either Econ 1101 or Econ 1401

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**RECOMMENDED TEXTBOOK and MATERIALS\***

**Required:** Pearson, Charles S. *Economics and the Challenge of Global Warming*, Cambridge University Press, 2011.

Herman E. Daly, *Beyond Growth: The Economics of Sustainable Development*. Beacon Press, 1997.

Additional assigned readings from journals, newspaper and magazine articles

**Recommended:**

David G. Victor, *Global Warming Gridlock: Creating More Effective Strategies for Protecting the Planet*, Cambridge University Press, 2011.

Andres R. Edwards, *The Sustainability Revolution: Portrait of a Paradigm Shift*, New Society Publishers, 2005.

Juliet Schor and Betsy Taylor, eds. *Sustainable Planet: Solutions for the Twenty-first Century*, Beacon Press, 2003

Websites:

[http://www.ted.com/search?cat=ss\\_all&q=environmental+economics&page=3](http://www.ted.com/search?cat=ss_all&q=environmental+economics&page=3)

[www.ted.com/](http://www.ted.com/)

[http://www.ted.com/talks/michael\\_green\\_why\\_we\\_should\\_build\\_wooden\\_skyscrapers.html?source=email#.Ud77Zwdb0ix.email](http://www.ted.com/talks/michael_green_why_we_should_build_wooden_skyscrapers.html?source=email#.Ud77Zwdb0ix.email)

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SAMPLE SEQUENCE OF TOPICS AND TIME ALLOCATIONS (number of hours)\*

**Week 1:** Overview of Environmental Economics and the current debates about climate change

Assigned readings: Pearson, *Introduction and Road Map*, pgs. 1 – 8; Ch. 1: *Climate Change: Background Information*, pgs. 9 – 18.

**Week 2:** How do economists view environmental/ecological crises and how to address them? A mainstream vs. a critical view

- Environmental costs as “externalities” and a reflection of market failure (traditional economic theory)
- the conflict between more vs. less government regulation of industry practices
- the view of increased regulation as a constraint on economic growth and progress vs. regulation aimed at protection of vital natural resources and sustainable economic growth.

Assigned readings: Pearson, Ch 2: *The Role of Benefit Costs in Climate Policy*, pgs. 19 – 40; Ch 6: *Targets and Tools* (pgs. 131-141 *Market Incentives vs. Regulation*); Daly, ch. 2 *Elements of Environmental Macroeconomics*.

**Week 3:** The challenges to promoting sustainable economic growth and renewable resources in a consumer driven market/capitalist economy

- The consumer as central to the survival and thriving of market economies
- Moving from the ‘disposable’ society to the concept of renewability

Assigned readings: 1) article: William R. Emmons, “Don’t Expect Consumer Spending to be the Engine of Economic Growth in Once Was,” *The Regional Economist*, Jan. 2012, Federal Reserve Bank of St. Louis); 2) Consumers: Changing the Terms of Engagement, in *The Consumption Dilemma: Leveraging Points for Accelerating Sustainable Growth*, World Economic Forum, April 2011; 3) Daly, ch. 1, *Moving to a Steady State Economy*, pgs. 31 - 45. **Guest lecturer - Sociology**

**Week 4:** The global economic impact of emerging market economies

- Global demand for food, automobiles and other consumer goods promotes increased world demand for fossil fuels
- Rapid Industrialization and challenges to clean air, water, land.
- Unplanned economic growth and urbanization in rapidly expanding new market economies poses challenges to slowing climate change
- How are emerging economies adapting industry practices to support renewable resources?

Assigned readings: 1) Stuart L. Hart, *Beyond Greening: Strategies for a Sustainable World*, *Harvard Business Review*, Vestas, Jan – Feb 1997; 2) Bouton, Lindsay and Woutzel, *New Models for Sustainable Growth in Emerging-Market Cities*, McKinsey and Co., 2012; 3) Lyuba Zarsky, *Climate Resilient Industrial Development Paths: Design Principles and Alternative Models*, Global Development and Environment Institute, Working Paper No. 10 -01, Feb. 2010

**Week 5:** Sustainable land use; renewable agricultural practices and fair labor standards with agricultural trading partners

- Supporting sustainable farming practices and the preservation of vital natural resources in developing and emerging economies; Providing economic incentives for farmers, growers to preserve land as an alternative to turning land over to unsustainable development
- Sustainable and humane practices in food production: raising, processing, etc. of beef, chicken, sustainable aquaculture
- Sustainable tourism
- What are the macroeconomic benefits?

Assigned readings: 1) study – Chapter II: *Understanding the current food system in the context of climate change — major components and drivers*; and 2) Chapter IV: *Essential actions for food security and climate stabilization in Achieving Food Security in the Face of Climate Change*, Commission on Sustainable Agriculture and Climate Change, 2012, <http://ccaafs.cgiar.org/commission/reports>

**Guest lecturers - Geosciences and Hospitality Management**

**Week 6:** Uneven global economic development and the challenges to developing and encouraging renewable resource and conservation practices

- The limits to unsustainable global economic growth; encouraging renewable growth

Assigned readings: Pearson, ch. 5 *Strategic Responses*; Daly, ch. 7 *Operationalizing Sustainable Development by Investing in Natural Capital*.

**Week 7:** Alternatives to the current GDP for measuring economic growth and progress; the need for a “green GDP.”

- Why a “green GDP?”
- A critical look at how economic growth and progress is currently measured in the U.S.
- Measurement proposals in use or under consideration in other advanced and developing nations
- Why does method of measurement of economic progress matter?

Assigned readings: Daly, Ch. 8 *Toward a Measure of Sustainable Net National Product*, and ch. 9 *On Sustainable Development and National Accounts*.

**Week 8: Midterm Exam**

**Week 9:** Examples of where investment in renewable energy and economic practices is generating measurable benefits in the U.S. economy

- Examine current examples across markets in the U.S. and in emerging economies
- Commercial, industrial and residential practices
- Wind, solar, and other alternative energy sources – how much have these grown as a share of the energy economy?

Assigned readings: 1) *Annual Energy Outlook 2011*, The Paul H. Nitze School of Advanced International Studies, Washington December 16, 2010; 2) *The Coming Energy Revolution*, People and Planet. [www.peopleandplanet.net](http://www.peopleandplanet.net)

**Week 10:** The Growth of Green Building Design, Construction, Engineering and Architecture

- Measuring cost and resource savings from air purification and recycling; water (non-drinking) recycling; energy efficient windows in residential and commercial buildings
- Renewable energy sources: solar, wind.
- Look at case studies; examples
- Examples from emerging and developing economies
- Economic impact of green practices

Assigned readings: 1) U.S. Green Building Council, *Green Jobs Study*, Booz, Allen, Hamilton; 2) Union of Concerned Scientists, *Benefits of Renewable Energy Use, 1999*.

## ***Guest Lecturers – Architectural Design; Sustainable Technology***

**Week 11:** How to promote and expand upon sustainable growth practices?

- Should government promote commercial, industrial and residential use of alternative energy sources and renewable building practices and materials use?
- What forms might such incentives take? Tax credits? Direct subsidies? Other methods?
- How would the growth of sustainable economic practices by business, consumers, builders, etc. contribute to the renewal of the U.S. economy?

Assigned reading: 1) Pearson, ch 6 *Targets and Tools*, pgs. 129 – 140; 2) Warwick J. McKibbin and Peter J. Wilcoxon, *A Credible Foundation for Long Term International Cooperation on Climate Change*, CENTRE FOR APPLIED MACROECONOMIC ANALYSIS, CAMA Working Paper 15/2006, <http://cama.anu.edu.au>

**Week 12:** Economic and human costs of global climate change

- Loss of farmland
- Droughts/floods/ changes in climate patterns threaten sustainable world food supply
- How do unsustainable farming practices contribute to the loss/degradation of vital natural resources

Assigned readings: 1) Richard S.J. Tol, *Estimates of the Damage Costs of Climate Change. Part I: Benchmark Estimates, 2002* 2) Center for Integrative Environmental Research, *The U.S. Economic Impacts of Climate Change and the Costs of Inaction*, October 2007; 3) New York Times, Opinion, *Is This The End?* November 25, 2012

**Week 13:** Environmental, economic and social justice

Assigned Readings: 1) Robert D. Bullard, *Differential Vulnerabilities: Environmental and Economic Inequality and Government Response to Unnatural Disasters*, *Social Research*, 75, 2008: 753-784. 2) Donald D. Stull, *Activism, Poultry Production, and Environmental Justice in Western Kentucky*, *Sustain*, Spring/Summer 2004, #10

### ***Guest Lecturer - Sociology***

**Week 14:** Fair trade vs. free trade; why do “fair trade” practices promote renewable resources as opposed to free trade?

Assigned reading: 1) Pearson, ch. 7 *Trade and Global Warming*; 2) Daly, ch.10 *Free Trade and Globalization vs. Environment and Community*; and ch 11, *From Adjustment to Sustainable Development: The Obstacle of Free Trade*.

**Week 15: Final Exam**

**COURSE INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS:** To develop an understanding of the fundamental concepts of environmental economics. Specifically, course objectives include the following:

<i>LEARNING OUTCOMES<sup>1</sup></i>	<i>ASSESSMENT METHODS</i>
1. Students in the course should be able to demonstrate an understanding of many dimensions of sustainability as they relate to the potential for renewed economic growth.	1. The midterm and final exams, which will include essay questions, will test students' understanding of sustainability issues as they relate to economic practices and policy
2. Demonstrate a knowledge of the importance of changing economic behavior – from consumers, to business practices to government – to build upon the move toward sustainable economic practices	2. Class discussions of assigned articles and other supplementary readings.
3. Identify a range of tools from environmental economics that can be applied to solving real world environmental challenges that impact the U.S. economy.	3. Both the quizzes, exams and class discussions will serve as tools to encourage students to make the connections between environmental goals and addressing economy-wide and global economic issues.
4. Develop a breadth and depth of knowledge of how to begin to apply the concepts of sustainability to consumer, business and trade practices.	4. Through the written research project and/or case study, students will focus on a problem/issue, the challenges posed by that issue and critically examine various solutions.

**GENERAL EDUCATION LEARNING OUTCOMES/ASSESSMENT METHODS**

<i>LEARNING OUTCOMES</i>	<i>ASSESSMENT METHODS</i>
<b>1. KNOWLEDGE:</b> To develop an understanding of the key concepts that relate to environmental economics, the central topics and theories of how to address environmental problems through economic policy.	1. Quizzes that both test an understanding of basic concepts and that require students to express their understanding in writing (short essay quizzes)
<b>2. SKILLS:</b> Develop and apply the tools of environmental economics to be able to critically question, analyze, and discuss environmental economic problems and issues; Develop and strengthen the ability to discuss concepts and thoughts in writing.	2. Completion of essay questions on exams; class discussions of questions tied to topics covered in class and to supplemental short readings and articles on timely relevant issues; students analyze, evaluate and consider policy options
<b>3. INTEGRATION:</b> Apply the tools acquired in the course to be able to build upon an understanding of environmental issues and sustainability across disciplines, both in the social sciences and other disciplines.	3. Research project which requires students to select and define a topic, problem or issue and examine possible solutions drawing upon and employing the tools of related disciplines.
<b>4. VALUES, ETHICS, AND RELATIONSHIPS:</b> Develop an understanding of and ability to apply diverse perspectives to the understanding of sustainability/environmental economics; work creatively with others in group problem solving; develop a	4. Weekly in-class group assignments; assignments encourage student discussion and sharing of ideas and perspectives; focused discussions that encourage students

respect for diverse viewpoints and apply the skills and concepts covered in the course to the analysis of related issues and concepts across other disciplines	to question and think critically to develop their own perspectives on issues covered in the class .
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From: Important General Education Learning Goals (6/1/11) DRAFT

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SCOPE OF ASSIGNMENTS and other course requirements\*

Students in this course will be required to complete a written research project resulting in a final paper of approximately 5 pages. This may consist of a topic chosen from topics covered in the course or a case study tied to a particular topic in the student’s major course of study. There will also be a midterm and final exam, both of which will place an emphasis on a written understanding of key concepts covered in the course and readings; Two quizzes consisting of a choice of one or two essay questions; class discussions of assigned readings – students will be expected to be prepared to discuss assigned questions based on the readings. The course will be writing intensive.

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METHOD OF GRADING – elements and weight of factors determining the students’ grade\*

Midterm exam	25%
Community based research project/case study	30%
Final exam	25 %
Group presentation of research findings	10 %
In-class assignments, discussion, blog posts; class participation; attendance	15%

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\*Scope of Assignments and Method of Grading to be determined at discretion of the instructor.

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ACADEMIC INTEGRITY POLICY STATEMENT

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

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COLLEGE POLICY ON ABSENCE/LATENESS

A student may be absent without penalty for 10% of the number of scheduled class meetings during the semester as follows:

Class Meets	Allowable Absence**
1 time/week	2 classes
2 times/week	3 classes
3 times/week	4 classes

\*\*Each department and program may specify in writing a different attendance policy for courses with laboratory, clinical or field work. If the department does not have a written attendance policy concerning courses with laboratory, clinical or field work, the College policy shall govern.

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### **Course Perspective**

Neoclassical/traditional economic theory and analyses examine the problem of externalities – *the negative effects or byproducts of producing* - (such as pollution) largely within the context of “market failure,” the failure or shortcomings of the market system to efficiently address problems of pollution or overuse of resources on its own without government intervention. Government regulation of industry is viewed as the principal source of addressing and/or correcting such market failures, whether by enforcing a set of required laws and policies to protect air, water and land quality and/or imposing a combination of fines or even stiffer penalties for not taking the required precautions to prevent an event from occurring or for not taking the necessary safety precautions to prevent environmental damage.

This mainstream approach views the issue of the environmental impact of economic decisions largely from a microeconomic perspective – one which sees the choices that individual firms make as imposing certain economic costs on the society/economy.

On the macroeconomic level, the nation’s Gross Domestic Product measures the final market value of all goods and services produced within a given period of time, such as a quarter or a year. Included in the measure of GDP is all economic activity which generates income, output and expenditure. Thus, in addition to the market value of producing such vital goods and services as automobiles, wheat, houses, legal services and accounting services, GDP counts the expenditure and income generated through the process of cleaning up after the effects of environmental disasters such as superfund sites, oil spills, rescuing and restoring affected wildlife and other attempts to correct an “externality.”

In sum, no distinction is made in GDP measurement between the social “goods,” – the benefits to the economy of producing goods and services and the social “bads,” – the costs of cleaning up and/or restoring resources following an environmental accident or disaster.

The proposed course in Environmental Economics examines the issue of sustainable economic growth and development, the growing threats to vital resources and the measurement of economic growth and development employing a broader vision and a more critical analysis of the impact of environmental degradation on the economic health of society. It also approaches the study of environmental economics from an international perspective, examining the challenges to sustainable economic growth and renewable resource practices posed by the vast differences in the stages of economic development from agricultural to industrial and from industrial to service based economies; the challenges to long standing production and other resource use practices posed by the emerging field of renewable energy;

### **Bibliography: Environmental Economics**

Charles D. Kolstad. *Environmental Economics*, 2<sup>nd</sup> ed. Oxford University Press, 2010



William C. Whitesell . *Climate Policy Foundations: Science and Economics with Lessons from Monetary Regulation*, Cambridge University Press, September 2012

Charles S. Pearson. *Economics and the Challenge of Global Warming*, Cambridge University Press

David C. Victor. *Global Warming Gridlock: Creating More Effective Strategies for Protecting the Planet*, Cambridge University Press, 2011.

Karsten Neuhoff. *Climate Policy after Copenhagen: The Role of Carbon Pricing*, Cambridge University Press

Edward B. Barbier. *Capitalizing on Nature: Ecosystems as Natural Assets*, Cambridge University Press

Christian dePerthuis. *Economic Choices in a Warming World*, Cambridge University Press

Nicholas Stern. *The Economics of Climate Change*, Cambridge University Press

Herman E. Daly, *Beyond Growth: The Economics of Sustainable Development*. Beacon Press, 1997.

David Pearce, and Edward Barbier. *Blueprint for a Sustainable Economy*, Earthscan Publications, 2000

Michael Shellenberger, and Ted Nordhaus. *Break Through: From the Death of Environmentalism to the Politics of Possibility*, Houghton Mifflin, 2007

Jerry Mander, ed. *The Case Against the Global Economy*, Sierra Club Books, 1997

Joshua Karkiner. *The Corporate Planet: Ecology and Politics in the Age of Globalization*, Sierra Club Books, 1997

Brian Milani. *Designing the Green Economy*, Rowman & Littlefield Publishers, 2000

Lester Brown. *Building an Economy for the Earth*, W.W. Norton, 2001

Joshua Farley, and Herman E. Daly. *Ecological Economics: Principles and Applications*, Island Press, 2003

William E. Rees, and Mathis Wackernagel. *Our Ecological Footprint: Reducing Human Impact on the Earth*, New Society Publishers, 1995

Paul Hawken. *The Ecology of Commerce*, Collins, 1994

William K. Jaeger. *Environmental Economics for Tree Huggers and Other Skeptics*, Island Press, 2005

Suzanne Iudicello and Micahel L. Weber and Robert Wieland. *Fish, Markets, and Fishermen: The Economics of Overfishing*, Island Press, 1999

Ed Ayres. *God's Last Offer: Negotiating for a Sustainable Future*, Four Walls Eight Windows, 2000

Paul Hawken, Amory Lovins, and L. Hunter Lovins. *Natural Capitalism: Creating the Next Industrial Revolution*, Back Bay Books, 2000

Daniel Pauly, and Jay Maclean. *In a Perfect Ocean: The State of Fisheries and Ecosystems in the North Atlantic Ocean*, Island Press, 2003

Jim Merkel. *Radical Simplicity: Small Footprints on a Finite Earth*, New Society Publishers, 2003

Nicky Chambers, Craig Simmons, and Mathis Wackernagel. *Sharing Nature's Interest: Ecological Footprints as an Indicator of Sustainability*, Earthscan Publications, 2001

E.F. Schumacher. *Small is Beautiful, 25<sup>th</sup> Anniversary Edition: Economics As If People Mattered: 25 Years Later (With Commentaries)*, Hartley and Marks Publishers, 2000

Jonathan Harris, et. al., eds. *A Survey of Sustainable Development: Social and Economic Dimensions*, Island Press, 2001

Andres Edwards. *The Sustainability Revolution: Portrait of a Paradigm Shift*, New Society Publishers, 2005

Juliet Schor and Betsy Taylor, eds. *Sustainable Planet: Solutions for the Twenty-first Century*, Beacon Press, 2003

Tom Tietenberg, and Lynne Lewis. *Environmental Economics & Policy, 6<sup>th</sup> ed.*, Prentice Hall, 2010

Cédric Afsa, Didier Blanchet, Vincent Marcus, Pierre-Alain Pionnier and Laurence Rioux (INSEE), and Marco Mira d'Ercole, Giulia Ranuzzi and Paul Schreyer (OECD). *SURVEY OF EXISTING APPROACHES TO MEASURING SOCIO-ECONOMIC PROGRESS*; Commission on the Measurement of Economic Performance and Social Progress.

Robert J. Bullard, ed. *The Quest for Environmental Justice: Human Rights and the Politics of Pollution*, Sierra Club Books, 2005.