

**Pratt Institute, School of Architecture  
Graduate Center for Planning and the Environment  
Spring 2006**

**EMS 6???: Environmental Economics**

Credits: 3 credits

Location/Date: TBD

Type of Course: Lecture/Seminar

Required EMS course

Instructor: Dr. Gelvin Stevenson

Phone: 718-863-4156

E-mail: gelvins@earthlink.net

Office Hours:

---

**Course Description:**

This course examines the relationship between the environment and socioeconomic systems. An economic framework is used to identify the causes of environmental problems and their potential solutions. The course is interdisciplinary, incorporating material from the natural sciences, philosophy and other social sciences, in examining the issue of sustainable development. This course will emphasize contemporary environmental policy in an urban context, with an focus on the equity and efficiency aspects of environmental issues. The course will begin with consideration of several analytical tools (e.g. marginal analysis, cost-benefit analysis, public goods, risk and alternatives assessment and equity analysis). The second section will examine the role of the public sector in addressing these issues and the relative effectiveness of the various tools at its disposal (e.g. regulation and market-based incentives).

**Goals/Learning Objectives:**

To provide the student with: (1) an understanding of the multi-faceted relationship between the environment and the economy; (2) the ability to apply economic analysis and analytic tools to environmental issues; (3) an understanding of the strengths and weaknesses of current economic theory and analyses when applied to the environment; and (4) a knowledge of several critical environmental issues, including global warming and climate change, acid deposition, energy, water, toxins, materials and solid waste, fisheries, forests, biodiversity and habitat preservation.

This course will emphasize contemporary environmental economic policy, both in the US and globally, with an emphasis on the equity and efficiency aspects of environmental issues. The course will begin with consideration of several analytical tools (e.g. marginal analysis, cost-benefit analysis, public goods, risk and alternatives assessment and equity analysis). The second section will examine the role of the public sector in addressing these issues and the relative effectiveness of the various tools at its disposal (e.g. regulation and market-based incentives). A particular emphasis will be on the potential for application of alternative economic approaches. Finally, the class will apply these methodological and public policy tools to various environmental issues New York City and Region, especially its low-income and minority communities, with the goal of devising creative solutions to local environmental problems.

## **Outcomes:**

Students will be familiar with the evolution of environmental economic theory, methodology and analytical tools in the US and globally and will develop the needed critical skills to discern the nested and complex issues related to environmental planning decisions. In addition, students will learn how and when to apply alternative environmental economic methodologies and analytical tools and how to evaluate their effectiveness.

## **Course Requirements**

- Regular attendance and participation in class discussions
- A mid-term and a final exam
- A research paper on an approved topic

In addition to the creative problem-solving attempted in class, each student will complete a research project that uses the analytical tools to analyze some aspect of a current issue. It is preferred, but not required, that the project be accomplished in conjunction with a community-based organization (CBO) currently involved with the issue. Students can work alone or in groups. These projects will be presented in class, and in conjunction with the class scheduled to deal with that particular issue.

Examples of issues could include: solid waste policy, recycling and the placement of waste transfer facilities; asthma incidence and the sources of air pollution; water quality and the decision whether to filter or to protect the watershed; energy generation and the location of electric generators; energy efficiency and cost; fixing the split incentives between landlords and tenants; transportation and air quality. Topics must be approved in advance.

The project will apply the methodologies you learn in class to a current issue in New York City. The target is a 15 page paper, with a minimum of 10 and a maximum of 20 pages.. You can work alone or in groups, but if you work in groups, you must each produce a unique and specific body of work that you will be graded on. You will present your project to the class.

Examples of methodologies to be applied are: measuring benefits, measuring costs, cost-benefit analysis, risk assessment and its short-comings; alternatives analysis; marginal analysis (marginal damage and marginal abatement cost functions); property rights; and equity issues.

The Project assignment has three deliverables, due on these dates or earlier, depending on the date of your class presentation:

- a one-page concept paper
- a detailed outline
- the final paper due at the end of the term

## Methods of Assessment:

Grades will be calculated as follows:

First exam (on methodologies and policies)	30%
Final exam (review and applications)	30%
Project	30%
Class participation	10%

## Readings:

We will rely on one text for most of our methodological readings and overviews of environmental issues, but will supplement it with readings to be distributed in class, in particular on New York City and its environs and other relevant material. These will come from a variety of sources and will be available in class, on reserve in the library, on the Internet, or from government or other sources.

The required text is James R. Kahn, *The Economic Approach to Environmental and Natural Resources*, Third Edition, The Dryden Press, New York, 1998.

World Watch Papers: "Getting the Signals Right" by David Malin Roodman (No. 134) and "Mind Over Matter" by Gary Gardner & Payal Sampat (No. 144).

Students will subscribe to the free on-line publication: "Rachel's Health and Environmental Weekly" (RHEW) at [www.rachel.org](http://www.rachel.org). Several past issues of that newsletter will be assigned. They can all be found archived on that web site.

## Weekly Schedule and Readings:

### Part I - Introduction

#### Week 1 Environment in Western Thought & Indigenous Cosmology

*The purpose of this session is to introduce the course, to gain an overview of the place of the environment in our society and economy, to begin developing an analytical framework for the environment, to place NYC in an environmental context.*

#### Topics and readings:

**Typology of the environment:** natural resources, resource flows and environmental resources

**Reading:** Kahn, Chpt. 1, pp. 4-5

Adamson & Stevenson, Indigenous Economics forthcoming

**The environment in a urban context**—global, regional & local pollution  
**Measuring of GDP and the environment:** Environmental Degradation & the Measurement of Income, GDP, Sustainability and Environmental Quality, The Measurement of Environmental Quality & Environmental Analogues to GDP.

**Reading:** Kahn, pp. 142-145

**Discussion** of research topics

## Part II: Market Failures

Week 2

**Economic Efficiency & Markets: How the Invisible Hand Works (and doesn't)**

**Reading:** Kahn, Chpt 2

*In a “perfectly functioning economy” there would be no environmental problems. Any pollution would be the “optimal amount” or compensated for. In this session we examine why, within an economic framework, environmental problems exist. In other words, in what ways does the market economy not function properly?*

**Imperfect competition**

**Imperfect information**

- Too little information
- Biased information and propaganda

Readings:

\* REHW #724, “Fluoridation: Time for a Second Look?”

\* REHW #495 & 496, “Chemical Industry Strategies,” Parts 1 & 2

\* REHW #581, Jan 15, 1998, “Follow the Money”

**Public goods:** non-rival and non-excludable

NYC: Parks, community gardens

**Property Rights**

**Reading:** Burger, Joanna and Michael Gochfeld, “Tragedy of the Commons,” Environment, Dec. 1998, pp. 4-13, 26-27. (handout)

**Externalities**

NYC: Second-hand smoke, pollution, Medical waste incinerator and Asthma Alley

### **Inappropriate government intervention**

NYC: The Power Broker & the location of the Triborough Bridge

**Reading:** Caro, Robert A., The Power Broker, pp. 390-391. (handout)

### **Dynamic inefficiency and geographic concentration**

Allocation across time and space

## **Part III: Government Policies**

Week 3

### **Government Intervention in Market Failure**

**Reading:** Kahn, Chpt. 3

*What can the public do about these environmental problems? Which policies are available? appropriate? most effective? These are the tools that we will apply during the rest of the course to the environmental issues we confront.*

*The Coase Theorem v. Pigou. We begin with a fundamental debate about whether government should intervene in markets to solve environmental problems, or stay out of the way and let the interested parties negotiate among themselves. This debate is between two historical points of view from A.C. Pigou and Ronald Coase (The Coase Theorem). We won't spend too much time on this, but you do need to become familiar with the players and the issues.*

### **TYPES OF GOVERNMENT INTERVENTION**

#### **Direct production**

NYC: Parks, municipal solid waste, sewage and water

#### **Moral suasion/public education**

NYC: water conservation, recycling

#### **Pollution prevention technologies**

- Subsidize
- Create markets

NYC: can NYC use its buying power to accelerate the development of clean technologies?

#### **Command & control**

Air pollution, water pollution, leaded gasoline, lead in paint

**Reading:** on regulation, TBA

#### **Market-based incentives, e.g. marketable pollution permits, taxes**

NYC: Water meters, taxes

**Reading:** World Watch Papers: "Getting the Signals Right" by David Malin Roodman (No. 134)

Reading on water meters TBA

Marginal damage function and marginal abatement cost and how to use these to evaluate government policies

## **Part IV: Analytical Framework & Tools**

*In the following two secessions we will learn the analytical methods and tools that we will then apply to various situations for the rest of the course. These are the crux of the course; they provide the foundation for what follows, so learn them well.*

**Week 4**

**Valuing the Environment for Decision Making**

**Reading:** Kahn, Chpt. 4

**Revealed preferences:** Hedonic pricing and wage techniques, travel cost model

**Stated preferences:** Contingent valuation, conjoint analysis

**Risk assessment**

**Reading:** REHW #652, "The Waning Days of Risk Assessment"

**Alternatives assessment**

**Reading:** TBA

**Cost-benefit Analysis**

- Measuring costs
- Measuring benefits
- Discounting and discount rate

**Reading:** For discounting, see Kahn, pp. 34-36

## Week 5

### Valuing the Environment for Decision Making (cont.)

**Reading:** Kahn, Chpt. 4

**Cost effectiveness: If it's going to be done, what is the least costly way?**

**Reading:** Not in Kahn; explained in class

**Distribution** Pareto conditions:

- Pareto optimality (or Pareto efficiency),
- Pareto improvements
- Kaldor-Hicks Criteria

**Readings:** Handouts (Chapman on Pareto Optimal & other criteria)

**Equity: definition and measurement**

**Readings:** Handouts (Chapman p. 73 & Lesser et.al. p. 58)

**Precautionary Principle**

**Readings:** REHW #657 and #586

**Review of material to date**

## Week 6

### Mid-term Exam

## Part V: Issues & Applications

Applications of earlier discussed materials. We'll discuss the Chapter in our text book for the first session and then apply that to NYC and other issues in the second session.

## Week 7

### AIR

- Global Warming
- Acid Deposition
- Pollution—stationary
- Pollution—mobile

**Readings:** Kahn, Chpt. 6 (Global Climate Change & Ozone Depletion) & Chpt. 7 (Acid Deposition) & Chpt. 15 (Toxins)

**Week 8**

**Concept paper  
due**

**NYC:**

- Asthma Alley
- Coal boilers in schools
- Medical waste incinerator
- Transportation

**Readings:** REHW, West Nile Virus, #709 & #710

Ghettoization of Asthma (handout)

More readings on asthma, TBA

NRDC et. al. Sources of Air Pollution & How They Are Regulated (handout)

Green map for these four sections [www.greenmap.org/nyc](http://www.greenmap.org/nyc)

**Week 9**

**WATER**

**Reading:** Kahn, Chpt. 14 (Water Resources)

Additional reading TBA

**Week 10**

**NYC:**

- Filtration plant
- Watershed protection areas
- NY Harbor Estuary

**Project outline  
due**

**Readings:**

REHW, Excrement Happens, #644 & #645

NY-NJ Harbor Estuary Program: Summary of the Comprehensive Conservatn & Management Plan, March, 1996 & Successes and Challenges, Feb, 2001 (handout)

Under Attack: NY's Kensico & West Branch Reservoirs Confront Intensified Development, NRDC, Introduction, pp. 1-4 & Recommendations, pp. 31-36 (handout)

Additional readings, TBA

**Session 11**

**ENERGY**

**Readings:**

Kahn, Chpt. 8 (Energy & the Environment)

Additional readings TB

**Week 12**

**NYC:**

- Electricity generating plants
- Renewable energy sources
- Deregulation
- Transportation

**Readings:**

NRDC Fact Sheet on NYC Electricity Issues (handout)

Reading on location of generating plants in poor communities TBA

Material on Solar Challenge

Additional readings TBA

**Session 13**

**MATERIALS**

**Readings: Kahn, Chpt. 9 (Material Policy: Minerals, Materials, and Solid Waste)**

World Watch Paper: "Mind Over Matter" by Gary Gardner & Payal Sampat (No. 144)

**Session 14**

**NYC: municipal solid waste plan & EBUFs**

**Readings:**

**Final Project due**

Hammer, Steve, "Cutting New York's Trash Costs Through Pay-As-You-Throw," May, 2002, available at [www.wastesaver.com](http://www.wastesaver.com)

Warren, Barbara, "Sustainable Waste Management in NYC," Internet address TBA

"OWN Beats Back Gad Garbage Plans," from "Environmental Outlook: 2000," NYCEJA on [www.nyceja.org](http://www.nyceja.org)

Department of Sanitation material on recycling on DOS web site

Additional readings TBA

**Session 15**

**Final Exam**