

課程資訊 (Course Information)					
科號 Course Number	KECR2008	學分 Credit	3	人數限制 Size of Limit	50
中文名稱 Course Title	環境與資源經濟學				
英文名稱 Course English Title	Environmental and Resource Economics				
任課教師 Instructor	關雅文 Chiueh, Ya-Wen				
上課時間 Time		上課教室 Room			
課程大綱 (Syllabus)					
<p>一、課程說明(Course Description)</p> <p>環境經濟分析的作用在於建立了一個有系統的方法，以改善政策與計畫的設計與執行。本課程講授環境與資源經濟學的定義、原理、與分析方法，討論財產權理論與外部性理論，並將之應用於資源管理及環境政策與制度之設計與執行，並討論汙染、全球變遷以及永續發展等課題。本課程之教學原則為理論與實務並重，並鼓勵創意思考與課題討論。有助於學生繼續深入研討環境經營與管理相關領域。</p> <p>二、指定用書(Text Books)</p> <p>FieldC. Field &amp; Martha K.Barry. (2017). Environmental Economics: An Introduction(Seventh Edition). McGRAW-HILL Education International Edition.</p> <p>陳明健. (2013). 自然資源與環境經濟學 理論基礎與本土案例分析. 雙葉書廊有限公司</p> <p>三、參考書籍(References)</p> <p>BuchholzA.Rogene. (1998). Principles of Environmental Management --- The Greening of Business (Second Edition). Prentice Hall.</p> <p>Gareth Edwards-JonesDavies &amp; Salman HussainBen. (2000). Ecological Economics An Introduction. Hoboken, New Jersey: Wiley-Blackwell.</p> <p>LewisTietenberg &amp; LynneTom. (2015). Environmental &amp; Natural Resource Economics(Tenth Edition). PEARSON.</p> <p>MankiwGregoryN. (2014). Principles of Economics. Boston: Cengage Learning.</p> <p>TribeJohn. (2011). The Economics of Recreation, Leisure &amp; Tourism (fourth edition). U.K.: Butterworth-Heinemann.</p> <p>蕭代基、鄭蕙燕、吳珮瑛、錢玉蘭、溫麗琪. (2002). 環境保護之成本效益分析 理論、方法與應用. 台北: 俊傑書局股份有限公司.</p> <p>陳凱俐譯，2002。環境經濟學原理，揚智。</p>					

#### 四、教學方式(Teaching Method)

講授、討論、與小組討論。

#### 五、教學進度(Syllabus)

### **PART I: INTRODUCTION**

#### Ch 1 What is Environmental Economics?

Economic Analysis

The Importance of Incentives

Incentives: A Household Example

Incentives and Global Warming

The Design of Environmental Policy

Macroeconomic Questions: Environment and Growth

Benefit-Cost Analysis

Valuing the Environment

Environment and Development

International Issues

Globalization and the Environment

Economics and Politics

#### Ch 2 The Economy and the Environment

Natural Resource Economics

The Fundamental Balance

The Environment as an Economic and Social Asset

Basic Terminology

Emissions, Ambient Quality, and Damages

Types of Pollutants

Cumulative Versus Noncumulative Pollutants

Local Versus Regional and Global Pollutants

Point-Source Versus Nonpoint-Source Pollutants

Continuous Versus Episodic Emissions

Environmental Damages Not Related to Emissions

### **PART II: ANALYTICAL TOOLS**

#### Ch 3 Benefits and Costs, Supply and Demand

Willingness to Pay

Demand

Aggregate Demand/Willingness to Pay

Benefits

Cost

Opportunity Cost

Private and Social Costs

Cost Curves

The Shapes of Cost Curves

Technology

The Equimarginal Principle

Marginal Cost and Supply

Ch 4 Markets, Externalities, and Public Goods

Economic Efficiency

Efficiency and Equity

Markets

Markets and Social Efficiency

External Costs

Open-Access Resources

External Benefits

Public Goods

Ch 5 The Economics of Environmental Quality

Pollution Control—A General Model

Pollution Damages

Damage Functions

Marginal Damage Functions

Damages and Uncertainty

Damages and Time

Abatement Costs

Abatement Cost Functions

Aggregate Marginal Abatement Costs

The Socially Efficient Level of Emissions

Changes in the Efficient Level of Emissions

Enforcement Costs

The Equimarginal Principle Applied to Emission Reductions

**PART III: ENVIRONMENTAL ANALYSIS**

Ch 6 Frameworks of Analysis Impact Analysis

Environmental Impact Analysis

Economic Impact Analysis

Regulatory Impact Analysis

Cost-Effectiveness Analysis

Damage Assessment  
Green GDP  
Benefit-Cost Analysis  
The Basic Framework  
Scope of the Program  
Discounting  
Choice of Discount Rate  
Discounting and Future Generations  
Distributional Issues  
Risk Analysis  
Risk Assessment  
Risk Valuation  
Risk Management

#### Ch 7 Benefit-Cost Analysis: Benefits

The Damage Function: Physical Aspects  
    Measuring Damage Costs Directly  
    Health Costs  
    The Effects of Pollution on Production Costs  
    Materials Damage  
    Problems with Direct Damage Approaches  
Willingness to Pay: Estimating Methods  
Willingness to Pay: Revealed Preference Methods  
    The Value of Human Health as Expressed in Averting Costs  
    The Value of Human Life as Expressed in Wage Rates  
    Valuing Children's Health  
    The Value of Environmental Quality as Expressed in House Prices  
    The Value of Environmental Quality and InterCity Wage Differentials  
    The Value of Environmental Quality as Expressed in Travel Costs  
Willingness to Pay: Stated Preference Methods  
Valuing an Environmental Amenity  
Valuing Health Outcomes  
Problems of CV Analysis  
    Problems in Benefit Estimation  
    Discounting  
    Willingness to Pay Versus Willingness to Accept  
    Nonuse Values

#### Ch 8 Benefit-Cost Analysis: Costs

The Cost Perspective: General Issues

The With/Without Principle  
A Word on Social Costs  
The Distribution of Costs  
Concepts of Cost  
    Opportunity Costs  
    Environmental Costs  
    Enforcement Costs  
Costs of Single Facilities  
Costs of a Local Regulation  
Costs of Regulating an Industry  
    An Example  
    Sources of Cost Data  
    Misrepresentation of Costs  
    Actual Versus Minimum Pollution- Control Costs  
    The Effect of Output Adjustments on Costs  
    Long-Run Technical Change and Pollution-Control Costs  
Costs at the National Level  
Future Costs and Technological Change

#### **PART IV: ENVIRONMENTAL POLICY ANALYSIS**

##### Ch 9 Criteria for Evaluating Environmental Policies

Efficiency  
Cost-Effectiveness  
Fairness  
The Idea of "Social"  
    Environmental Justice  
    Enforceability  
Flexibility  
Incentives for Technological Innovations  
Materials Balance Issues  
Moral Considerations  
Government Failure

##### Ch10 Decentralized Policies: Liability Laws, Property Rights, Voluntary Action

Liability Laws  
    The Principle  
    Common Law  
    Statutory Law  
Property Rights  
The Principle

- Rules and Conditions
- Problems with Property Rights
  - to Internalize Externalities
  - Transactions Costs
  - Public Goods
  - Absence of Markets
  - Markets for Green Goods
- Voluntary Action
  - Moral Suasion
  - Informal Community Pressure
- Ch11 Command-and-Control Strategies: The Case of Standards
  - Types of Standards
    - Ambient Standards
    - Emission Standards
    - Technology Standards
    - Standards Used in Combination
  - The Economics of Standards
    - Setting the Level of the Standard
    - Uniformity of Standards
    - Standards and the Equimarginal Principle
  - Standards and Incentives
    - Political-Economic Aspects of Standards
  - The Economics of Enforcement
    - Enforcing Emission Standards
    - Enforcing Technology Standards
    - The Enforcing Agency
- Ch12 Incentive-Based Strategies: Emission Charges and Subsidies
  - Emission Charges or Taxes
    - The Economics of an Emission Tax
    - The Level of the Charge
    - Emission Charges and Cost- Effectiveness
    - Emission Taxes and Nonuniform Emissions
    - Emissions Charges and Uncertainty
    - Emission Charges and Tax Revenues
    - Emission Charges and the Incentives to Innovate
    - Emission Charges and Enforcement Costs
    - Other Types of Charges
      - On Carbon Taxes

Distributional Impacts of Emission Charges

Abatement Subsidies

Deposit-Refund Systems

Ch13 Incentive-Based Strategies: Transferable Discharge Permits

General Principles

Cap-and-Trade

The Initial Rights Allocation

Establishing Trading Rules

Reducing the Number of Permits

Nonuniform Emissions

CAPs and Problems of Competition

CAPs and Enforcement

CAPs and the incentives for R&D

CAPs and Uncertainty

Offset Trading

Emission Rate Trading

**PART V: ENVIRONMENTAL POLICY IN THE UNITED STATES**

Ch14 Federal Water Pollution-Control Policy

Types of Water Pollutants

Federal Policy: A Brief History

Technology-Based Effluent Standards

Efficiency and Cost-Effectiveness of TBESs

Experience with TBESs

TBESs and Incentives

TBESs and Enforcement

The Municipal Wastewater Treatment Plant Subsidy Program

The Safe Drinking Water Act (SDWA)

Coastal Water Pollution

Recent Policy Immolations in Water-Pollution Control

Nonpoint-Source Water Pollution Control

Total Maximum Daily Load (TMDL) Program

Emission Trading in Water Pollution Control

Ch15 Federal Air Pollution-Control Policy

Federal Air Pollution-Control Laws: A Brief Sketch

National Ambient Air Quality Standards

Stationary-Source Control

Technology-Based Effluent Standards

Differentiated Control

Cost-Effectiveness of the TBES Approach  
New Directions in Stationary-Source Control: Emission Trading  
The CAP Program for Reducing SO<sub>2</sub> Emissions  
The Role of the EPA  
Interstate Air Pollution  
Controlling Greenhouse Gas Emissions

#### Mobile-Source Air-Pollution Control

New-Car Emission Standards  
Direct Controls in the 1990 Clean Air Act  
Clean Cars  
Mobile-Source Standards and Climate Change  
Economic Issues

#### Ch16 Federal Policy on Toxic and Hazardous Substances

Economic Issues in Laws Governing Chemicals in Production and Consumer Products  
The "Balancing" Issue  
Differentiated Control: "Old" Versus "New"  
Uniform Standards  
On Technological Change in Chemicals  
Globalization and Chemicals  
Economic Issues in Federal Policy on Toxics in Water and Air Emissions  
Instrument Choice  
Hazardous Waste Reduction  
The Management of Hazardous Wastes  
Economic Issues in Handling Current Hazardous Waste  
Incentive-Based Possibilities  
Environmental Justice  
Radioactive Wastes  
Economic Issues in Handling Legacy Hazardous-Waste Sites  
Financing Hazardous-Waste-Site Cleanups  
How Clean Is Clean?  
Brownfields  
Natural Resource Damages  
Cleaning Up After the Cold War

#### Ch17 State and Local Environmental Issues

Environmental Federalism  
Constitutional Issues  
Efficiency Issues  
Race to the Bottom?



Policy Innovations at the State Level

Municipal Solid Waste

The Nature of the Problem

Technical Options for Reducing MSW

Current Policy

The Economics of Recycling

Producer Use of Recycled Material

Consumer Recycling Decisions

Producer Take-Back Programs

Local Environmental Regulations

The Increasing Role of the States

**PART VI: GLOBAL ENVIRONMENTAL ISSUES**

Ch18 The Global Environment

Global Climate Change

The Physical Problem

Human and Ecosystem Impacts

Scientific Uncertainties and Human Choice

Technical Responses to the Greenhouse Effect

Reducing Domestic GHG Emissions

Incentive-Based Approaches for Reducing Greenhouse Gas Emissions

International Efforts in Global Warming

The Kyoto Protocol

A New Global Greenhouse Climate Agreement

Estimating the Social Cost of Carbon

Biological Diversity

Ch19 International Environmental Agreements

General Issues

The Economics of International Agreements

Bilateral Agreements

Multilateral Agreements

The Distribution of Costs

Bargaining Issues

Cost-Effectiveness in Multinational Agreements

A Multilateral Success Story: The Montreal Protocol

The Physical Problem

International Response

The Economics of CFC Controls

## Ch20 Globalization

Dimensions of Globalization

On Sorting Out Cause and Effect

Trade and the Environment

Free Trade Versus Environmental Trade Restrictions

Globalization and a "Race to the Bottom"

The Pollution-Haven Issue

Trade and Carbon

Regional Trade Agreements

Environmental Trade Restrictions

## Ch21 Economic Development and the Environment

Environmental Degradation in Developing Economies

Economic Growth and the Environment

A Static View

Sustainability

Long-Run Relationships

Environmental Policy Choices in Developing Countries

Benefit-Cost Analysis

Reducing Environmental Disincentives

Institutional Policy: Property Rights

Population Policy as Environmental Policy

Instrument Choice in Developing Countries

The Role of the Developed Countries

Technology Transfer

Environmental Values in International Development Banks

## 六、成績考核(Evaluation)

期中報告 30%、期末考 30%、學期報告 40%。

## 七、可連結之網頁位址