MASTER SYLLABUS

ECON 320 – Environmental Economics

Created by: Karen Spellacy
Updated by: Edouard Mafoua
A. **TITLE:** Environmental Economics

B. **COURSE NUMBER:** ECON 320

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** No

E. **GER CATEGORY:** None

F. **SEMESTER(S) OFFERED:** Spring

G. **COURSE DESCRIPTION:**

Issues and policies involving renewable and nonrenewable energy, natural resource management, pollution control, global climate change, and sustainable development are explored through traditional neoclassical economics as well as through the contemporary approach of ecological economics.

H. **PRE-REQUISITES/CO-REQUISITES:**

a. Principles of Macroeconomics (ECON 101) or Principles of Microeconomics (ECON 103), GER Math and a minimum of 45 college credits with a GPA of 2.0 or better

b. Co-requisite(s):

c. Pre- or co-requisite(s):

<table>
<thead>
<tr>
<th><strong>STUDENT LEARNING OUTCOMES:</strong> Course Student Learning Outcome [SLO]</th>
<th><strong>PSLO</strong></th>
<th><strong>GER</strong></th>
<th><strong>ISLO</strong></th>
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<tbody>
<tr>
<td><strong>1.</strong> Revise national income accounts to include environmental issues</td>
<td></td>
<td>Critical Thinking</td>
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<td>Critical Analysis [CA]</td>
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<td><strong>2.</strong> Compare and contrast neoclassical economics and ecological economics approach to environmental issues</td>
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<td>Critical Thinking</td>
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<td>Critical Analysis [CA]</td>
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<td><strong>3.</strong> Estimate and analyze the supply of nonrenewable resources in multi period setting</td>
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<td>Critical Thinking</td>
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<td>Problem Solving [PS]</td>
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<td><strong>4.</strong> Determine sustainable profit maximizing management policies for renewable resources</td>
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<td>Critical Thinking</td>
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<td>Problem Solving [PS]</td>
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<td><strong>5.</strong> Recommend appropriate pollution control policies</td>
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<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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<td><strong>6.</strong> Explain the causes and consequences of climate change</td>
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<td>Communication Skills</td>
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<td>Written [W]</td>
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<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
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| 1     | Communication Skills  
Oral [O], Written [W] |
| 2     | Critical Thinking  
Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS] |
| 3     | Foundational Skills  
Information Management [IM], Quantitative Literacy/Reasoning [QTR] |
| 4     | Social Responsibility  
Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T] |
| 5     | Industry, Professional, Discipline Specific Knowledge and Skills |

**J. APPLIED LEARNING COMPONENT:** Yes______  No___X____

**K. TEXTS:**


**L. REFERENCES:**


**M. EQUIPMENT:** A technology enhanced classroom may be required by some instructors. A subscription to the Journal of Environmental Economics and Management would be desirable.

**N. GRADING METHOD:** A – F

**O. SUGGESTED MEASUREMENT CRITERIA/METHODS:**

As per core competency sheet

**P. DETAILED COURSE OUTLINE:**

**I. Introduction to Environmental Economics**

A. Major Environmental Issues

B. Traditional Economics Approach to Environmental Issues

C. Ecological Approach to Environmental Issues

D. Synthesis of Ecological and Traditional Economics Approaches

E. Brief History of Economic Development

F. Population Growth

G. Sustainable Development

**II. Economic Analysis of Environmental Issues**

A. Cost Benefit Analysis with Externalities

B. Welfare Analysis with Externalities

C. Property Rights

1. Pigovian Tax (Polluter Pays Principle)
2. Course Theorem

D. Nonrenewable Resource Allocation Over Time
   1. Present Value
   2. Future Value
   3. Hotelling’s Rule

E. Common Property Resources and Over Use
   1. Public Good

F. Cost Benefit Analysis of Environmental Outcomes
   1. Techniques of Valuation
      a. Contingent Valuation
      b. Demand-Side Methods
      c. Supply-Side Methods
      d. Social Discount Rate
      e. Expected Value (Dealing With Risks and Uncertainty)

III. Ecological Economics and Environmental Accounting
A. Natural Resources as Natural Capital
   1. Optimal Macroeconomics Scale

B. National Income and Environmental Accounting (Greening of National Income Accounts)
   1. Estimating Sustainable Economic Welfare
   2. Measures of True Income
   3. Weak and Strong Sustainability

C. Greening of National Income Accounts and Policy Implications

D. Energy and Resource Flow Analysis
   1. Nicholas Georgescu-Roegen and the Law of Entropy
   2. Input-Output Analysis
      a. National
      b. Global
   3. Ecological Economic Modeling
      a. Individual Process
      b. Complete System

IV. Energy and Resources Markets and Future Projections
A. Supply of Nonrenewable Resources
   1. Physical Supply
   2. Economic Supply
      a. Economic Reserves
      b. Subeconomic Resources
      c. Static Reserve Index and Expected Resource Lifetime
      d. Exponential Reserve Index and Expected Resource Lifetime

B. Economic Theory of Nonrenewable Resource Use
   1. Maximizing Resource Rents
      a. Competitive Market
      b. Marginal Extraction Cost
   2. Long Term Trends In Nonrenewable Resource Usage

C. Reserve Estimates of Nonrenewable Resources
   1. Reserve Base
   2. Reserve Base Index

D. Internalizing Environmental Cost of Resource Recovery
   1. Choke Price
   2. Backstop Resource
   3. Recycling

F. Economic and Ecological Analysis of Energy

G. Energy Trends and Projections
   1. Patterns of Use
   2. Future of World Oil Production

H. Energy Markets
   1. Commodity Futures and Energy Prices
Q. **LABORATORY OUTLINE: N/A**