A. **TITLE:** Environmental Economics

B. **COURSE NUMBER:** ECON 320  
   **SHORT TITLE:** Environmental Economics

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** No

E. **COURSE LENGTH:** 15 weeks

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

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** 3 lecture hours per week

H. **CATALOGUE 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. Pre-requisites/Co-courses: 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, or permission of the instructor.

I. **PRE-REQUISITES/CO-COURSES:** 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

J. **STUDENT LEARNING OUTCOMES:** Students will be able to:

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<tr>
<th>Course Objective</th>
<th>Institutional SLOs</th>
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| a. Revise national income accounts to include environmental issues               | 2. Crit. Thinking  
3. Prof. Competence                                                               |
| b. Compare and contrast neoclassical economics and ecological economics approach to environmental issues | 2. Crit. Thinking  
3. Prof. Competence                                                               |
| c. Estimate and analyze the supply of nonrenewable resources in multi period setting | 2. Crit. Thinking  
3. Prof. Competence                                                               |
| d. Determine sustainable profit maximizing management policies for renewable resources | 2. Crit. Thinking  
3. Prof. Competence                                                               |
| e. Recommend appropriate pollution control policies                              | 1. Communication  
2. Crit. Thinking  
3. Prof. Competence  
4. Inter-Intra Pers. Skills                                                       |
| f. Explain the causes and consequences of climate change                          | 1. Communication  
2. Crit. Thinking  
3. Prof. Competence                                                               |

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 (P/F, A-F, etc.):** A - F

**O. MEASUREMENT CRITERIA:** as per core competency sheet
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
      2. Privatization of Energy Markets
      4. Competitive vs. Regulated Markets
      5. Ethics in Energy Markets
      6. Economics of Alternative Energy Futures
   J. Future Energy Development
      1. Implicit Discount Rates and Energy Efficiency

V. Renewable Resources
   A. Ecosystem Management
      1. Economics of Forest Management
         a. Forest Loss and Biodiversity
         b. Institutional Failures in Forest Management
         c. Policies for Sustainable Forest Management
      2. Water Depletion and Renewal
         a. Demand Projections
         b. Increasing Supply
         c. Policies for Sustainable Water Management
VI. Pollution: Economic Analysis and Policy
A. Economics of Pollution Control
   1. Optimal Level of Pollution
   2. Marginal Costs and Benefits of Pollution Control
      a. Selecting Among Pollution Control Policies
B. Pollution Control Policies
   1. Standards
   2. Taxes
   3. Permits
   4. Transferable Pollution Permits

VII. Global Climate Change
A. Causes and Consequences of Climate Change
   1. Greenhouse Effect
      a. Trends and Projections for Temperature Changes
B. Economic Analysis of Climate Change
   1. Cost-Benefit Studies of Global Climate Change
C. Analyzing Long-Term Environmental Climate Changes
D. Policy Responses to Environmental Change

VIII. Environment, Trade and Development
A. World Trade and the Environment
   1. Environmental Impact of Trade
   2. Trade Agreements and the Environment
   3. Strategies for Sustainable Trade
B. Institutions for Sustainable Development
   1. Economics of Sustainable Development
   2. Reforming Global Institutions
   3. Policies for Sustainable Development