"We can't solve problems by using the same kind of thinking we used when we created them."
— Albert Einstein

This course introduces students to the field of ecological economics and explores how the field's simple premise — to recognize the fundamental dependence of the economic system on the environment — complicates matters for conventional economic theory and practice. While focusing on ecological economics, the intent is to expose students to a variety of thought on the theoretical relationship between economics and environment without ignoring questions of applications and implementation. Familiarity with neoclassical economics is helpful but not required.

Herman E. Daly, one of the founders of the discipline, taught this course for many years until his retirement in 2010. I was fortunate to study with Professor Daly and am thrilled to continue the tradition of teaching ecological economics at the University of Maryland's School of Public Policy.

GRADE ASSIGNMENT

- Participation = 20% of the grade
  Students are expected to arrive prepared to engage in open and active discussion.
  Laptop and smartphone use in class is not allowed.

- Two papers = 50% of the grade
  Students will receive further instructions on the papers in class. Outlines for each paper will be provided.

- Presentation = 10% of the grade
  Students will present one of their classmates' papers in class.

- Final exam = 20% of the grade
  The final exam will consist mainly of short essay questions.

Required books
- Ecological Economics: Principles and applications by Herman Daly and Joshua Farley; 1st or 2nd edition
- Capitalism 3.0 (A Guide to Reclaiming the Commons) by Peter Barnes, 2006
- America the Possible by James Gustave Speth, 2012

These books are required for purchase; all other materials will be posted on ELMS.
www.elms.umd.edu
1. The roots and rise of neoclassical economics

- Ancient roots of economics • Early economic questions: Trade vs. self-sufficiency; class and hierarchy; private property; distribution of income; household management • Economics and theology • Plato and Aristotle • Mercantilism & Colonialism • Rise of the state • Accumulation of wealth as an end • Richard Cantillon. 1st economist? • The English Classical School • Ends as given • Adam Smith • Thomas Malthus & Population growth • Jean-Baptiste Say & Say’s Law • David Ricardo • J.S. Mill & Compassionate utilitarianism • Stationary state • Political economy sunsets • Neoclassical economics rises • Formal price theory develops (Jevons and marginal utility theory of value) • Utility theories of demand and supply • Alfred Marshall & Firm theory • Allocation of resources; constrained-maximization decision-making; logic of choice • Wealth as an end • Wealth as a mean • Simonde de Sismondi • Aristotle and “charametrics” vs. “political economy” • Crafts-based society vs. industrial society • John Ruskin • Xenophon’s true wealth vs. illth • John Hobson • Questioning the Ultimate End • Organic Welfare • Richard Tawney • “The Acquisitive Society” • Principle of limitation • Economic activity as a servant, not the master • Macroeconomics & Instability • John Maynard Keynes & End of Laissez-faire

2. Dealing with social costs

- Natural economic order? • Social costs • Back to political economy • Classical economists and social costs • The Historicians and social costs • The Socialists and social costs • Pigou and social costs • Veblen and social costs • Monopolies and social costs • Dynamic analysis and social costs • Personal maladaptions • Jevons and the Coal Question • Economic availability vs. Physical availability of resources • Direct and indirect “rebound effects” from energy efficiency • Intergenerational equity • Roots of environmental economics • Silent Spring • Internalizing externalities • Welfare economics • Natural resource economics • Environmental economics • Pareto • Coase • Sustainable development and the Brundtland Commission • Alternative GNP indicators • Economic valuations • Stated preference • Revealed preference (hedonic regressions) • Nonuse values • Cost-benefit analyses • Discount rates • Command and control policy instruments • Market-based policy instruments • Double dividends • Introduction to Ecological Economics

3. The roots of ecological economics

- Materialism • Al Gore’s Global Marshall Plan • History of materialism and Western identity • Separation of facts and values • Individual identity and materialism • Materialist philosophy and the Greeks • Mind-body problem • Religion vs. Science • Positivism as philosophy of science • Atomism; mechanism; universalism; objectivism and positivism • Norgaard’s coevolutionary framework • John Stuart Mill and utilitarianism • Ethics and economics • Individual vs. whole • Global sustainability • Political internalization vs. Economic internalization • Distributional efficiency • Role of private property • John Stuart Mill’s stationary state • Self-regulating behavior • Non-interference principle • Marketplace as a “system of mutual coercion” • True liberty • Social beings • Hegel • Obligation to reciprocate • Early history of ecological economics • Ecology as separate from biology • The whole before the part • Energetics of ecological systems • Spaceship Earth • Entropy • Chaos theory • Main figures • Main meetings

4. How did we get here?

- Why care about economics? • Economists in governments • Rise of economists in the 1930s and 1940s • GATT (WTO) • 1960s and trade • 1970s and inflation • Bretton Woods > IMF > floating exchange rates • 1990s and beyond: Free trade • Economists and politics • Economists in the United States • Council of Economic Advisers • Office of Management and Budget • Congressional Budget Office • Macroeconomic policy • Monetary policy • Rise of CBAs • Current role of economists • Economists and the environment • Pollution law vs. Natural resource law • Conquering wilderness • “Partially cultivated country” • Preservationism vs. “wise use” and conservationism • Main environmental laws: CAA, CWA, ESA • Rise of advocacy organizations • Ubiquitous uncertainty • Environmental policy through litigation • Traditional regulatory tools: Prescriptive regulation; property rights; penalties; payments and persuasion • Problems with policy instruments: Efficiency; administrative costs; standards vs. technology • Science vs. Congress • Administration of environmental law • Tax law and environmental policy • Different taxes for different purposes • How did we get here? • America: Exploration of the West • Agriculture & Soil • Agriculture & Water • Role of the market • Global changes • Climate change and IPCC • Evidence of anthropogenic changes • Surface temperature changes • Ocean changes • Precipitation changes • Heat and humidity • 200 years from now • Agriculture, again • Nitrogen cycle • What is sustainability? • Molecular wars: Reductionism vs. Ecology
5. Introduction to ecological economics  
- Economics • Evolution of economics • Ecological constraints • The Whole & The Part • Optimal Scale & Uneconomic Growth • Throughput • Thermodynamics • Ends & Means • Steady-state economy • Finite planet • Entropy & Economics • Stock-flow resources vs. Fund-services resources • Public goods • Abiotic resources: Fossil fuels, minerals, water, land, and solar energy • Biotic resources: Renewable resources, ecosystem services, and waste absorption capacity • From empty to full world • Three concerns: Allocation, distribution, and scale • Steady state economics •
- October 1, 2013
- Readings on ELMS

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6. Ecological economics: Microeconomics  
- Basic market equation • Market imperfections: Monopoly, non-perfect competition, transaction costs, non-price adjustments • Supply & Demand curves • Shortages & Surpluses • Elasticity • Production functions • Substitutability & Complementarity • Utility functions • Market goods vs. Public goods • Externalities • Intertemporal discounting • Market failure & Abiotic resources • Market failure & Biotic resources • Technical solutions • Population growth • Tragedy of the commons • Legislating temperance • System stability • Carrying capacity • Economic indicators and scarcity of natural resources • Models of efficient resource extraction •
- October 8, 2013
- Readings on ELMS

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7. Ecological economics: Macroeconomics  
- Back to basics • Nature and the economy • 1st Law of Thermodynamics: Conservation of energy • 2nd Law of Thermodynamics: What goes in ≠ what goes out • Qualitative changes • Entropy • Free energy & Bound energy • Life & Entropy • Free recycling • Measuring welfare • Human needs and the economy • Use value vs. Exchange value • Virtual wealth • Seigniorage • Federal reserve system • Money • Distribution & Pareto optimality • Distribution and society • Normative questions • Discounting • Savings & Investment • Monetary market (interest rates & liquidity) • The IS-LM model • Monetary and fiscal policy • Inflation • Unemployment •
- October 15, 2013
- Readings on ELMS

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8. Ecological economics: International trade  
- Absolute advantage & Comparative advantage • Capital mobility • Globalization • Patents & Monopolies • Externalities & Competition • Specialization • Sustainable scale • Just distribution • Food security and free trade • Balance of payments • Exchange rates • Economic stability • History of timber trade • Forest clearing • Wood as energy, weaponry, and mode of transit • Economic core, periphery and trade • International exchange economy emerges • Early trade and deforestation • Environmental Kuznets curves • Monitoring and transaction costs of natural resource governance • Trade impacts on governance • Estimating physical flows • Ecological rucksack • Indirect resource flows in trade • Input-output models • Shifting environmental burden •
- October 22, 2013
- Readings on ELMS

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9. Ecological economics: Policy implications  
- Six policy design principles • Controlling throughput • Property rights • Sustainable scale • Direct regulation • Pigouvian taxes & Pigouvian subsidies • Tradeable permits • Just distribution • Caps on income and wealth • Minimum income • Returns to capital • Efficient allocation • Nonmarket goods and services • Uncertainty & Ignorance • Time and valuation • Asymmetric information • Subsidies for nonmarket goods • Seigniorage, again • International policies • Efficiency, reconsidered • Looking ahead • Paradigm Shifts • Summary • More on the steady-state economy • Opportunity cost of depletion • Net psychic income • Social institutions for steady-state • Moral growth • The problem with growth economics • Ten policy proposals •
- October 29, 2013
- 1st PAPER DUE

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10. Ecological economics: Applied  
- Limits of regulation and privatization • New commons • Commons trusts, dividends and rent • Universal birthrights • Applications • Models of the economy • Creating a shared vision • Vision 2050 • Leverage points for changing systems • Making democracy work • Blueprint for action • Examples • Modeling examples • Industrial infrastructure and entropic costs • Calculating exergy and negative entropy • “Embodied land” and “embodied labor” • Applying to 19th-century British trade • Calculating relative exchange rates • “Time-space compression” • Ecologically unequal trade • Social metabolism and input-output analyses • Material flow analysis • Physical trade balance • Post-neoclassical economics • Economic choices are social choices • Post-Georgescu-Roegen economics •
- October 5, 2013
- Capitalism 3.0

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11. Ecological economics: Applied, continued  
- Realism vs. hopefulness • America’s present • America’s future • Payments for ecosystem services • Differences in approaches: Environmental economics vs. ecological economics • Issues with payments: Measurement, bundling, scale-matching, property rights, distribution, funding, adaptive management • Institutional adjustments • Case of agricultural production •
- November 12, 2013
- America the Possible

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12. Critiquing “economics”

- Common misunderstandings
- Terminology issues
- Steady-state economics a sign of despair?
- Evolution within constraints
- Clarifying the “impossibility” theorem
- Sustaining employment
- Space colonization
- Monetizing ecosystem services, neoclassical economics all over again
- Millennium Ecosystem Assessment
- Dilution of nature in exchange values
- Weak vs. Strong sustainability
- Market-based instruments as incentives
- Valuation studies as communication tools
- Exporting commodification
- Julian Simon, the “doomslayer”
- Deconstructing “limits to growth”
- Long-run vs. Short-run effects
- From a closed system to an open one
- Resource availability depends on productivity and creativity
- More people, more creativity
- Humans as supreme
- Arbitrary anti-humanism
- Rebuttal to Julian Simon
- Debating the future of humankind
- Use and misuse of statistics
- Scarcity of resources and prices
- Stock and flow confusion
- Assumptions fill in gaps
- Overconsumption as a cause of resource depletion
- Increasing stocks of materials, food, and energy
- Technology, substitution, and efficiency
- Regional interconnectivity
- Values and consumption
- Is ecological economics dead?
- Big Science approach to modeling
- Dynamic equilibrium and universal laws in ecology
- Common law as foundation of environmental laws
- Changed political conversation
- Draining away moral power of environmentalism

13. Critiquing “ecological”

- Defining the “natural environment”
- Biodiversity in suburbia
- Scentization of the environment
- Feelings and meanings in places
- Natural history vs. Ecological theory
- Knowledge by “acquaintance” vs. Knowledge by “abstraction”
- EPA and “ecological endpoints”
- Ecological risk assessments
- On to ecosystem services
- Human disturbance
- Absence of stability
- Theater for landscapes
- Intelligent design for agnostics
- Aesthetic education
- Rethinking wilderness
- Wilderness as cultural invention
- Wilderness transformed from waste to treasure
- Romanticism and post-frontier ideology
- Supernatural, sublime, and tamed wilderness
- Wilderness as a refuge for the rich
- Wilderness for humans and nonhumans
- Use, abuse, and responsibility
- Wilderness as ubiquitous
- Laws of nature, do they exist?
- Correlative laws vs. Causal laws
- Philosophers of science and biological laws
- Laws of interconnected pieces
- Creating “nomological machines”
- Deep universal laws of ecology
- Laws, patterns, mechanisms, and generalizations
- Contingencies
- Variations of common themes
- Establishing management tools
- Community ecology complicates
- Macroecology
- The middle ground is a mess
- Do ecological thresholds exist?

14. STUDENT PRESENTATIONS

15. Future of ecological economics

- Crossroads
- Changing mainstream
- Decision time
- Primacy of sustainable scale
- Focus on natural resource valuations
- Back to the nature of money
- De-growth
- Response from mainstream economists
- Criticizing the “Growth Report”
- Economists on the “inside”
- Clarifying growth economics
- Methodological pluralism
- Climate change valuations
- CBAs, again
- Kuhnian paradigm
- Reinvigorating ecological economics
- Sustainable degrowth as an alternative to sustainable development
- Quality vs. Quantity
- Enjoying a good life
- Decline of “sustainable development”
- Pluralistic approaches vs. Realism
- Defining methodology
- Logical empiricism and epistemology
- Critical realism
- Changes in the decision-making process
- Science and technology for sustainability
- Examining the whole
- Nonlinearities and self-organization
- Including qualitative variables
- Post-normal science
- Complex systems
- Making hard policy decisions based on soft science
- Working with uncertainties and divergent values
- Extended peer communities

16. FINAL EXAM

November 19, 2013

November 26, 2013

December 3, 2013

December 10, 2013

Readings on ELMS

Student presentations start

2nd PAPER DUE

Readings on ELMS