

GEOG 3890 – Ecological Economics

http://urizen-geography.nsm.du.edu/~psutton/Sutton_Courses/Geog_3890_Ecological_Economics/Geog_3890_Sutton.htm

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Class Times & Places:
Tue Thu 2:00 – 3:50
Boettcher West Room 126

SYLLABUS

Course Description

Ecological Economics is an emerging transdisciplinary endeavor that reintegrates the natural and social sciences toward the goal of developing a united understanding of natural and human-dominated ecosystems and designing a sustainable and desirable future for humans on a materially finite planet. In this course we start with a basic overview and summary of the neo-classical economic perspective with a particular focus on the recognized market failures of public goods, common property, and externalities. The perspective of ecological economics consists of both positive and normative approaches to scientific and social problems. Positivist elements of ecological economics insist that the laws of thermodynamics hold for all natural and human systems. Normative elements of ecological economics are inherent in contemporary ideas of the notion of sustainability (e.g. distributional equity across space and through time). This course builds on the seminal and contrasting ideas of Adam Smith, Thomas Robert Malthus, and Charles Darwin as they pertain to a growing human population with increasing levels of technology, energy throughput, and social complexity on a planet with limited and finite resources. We begin with a reconceptualization of economic theory by imposing scientific constraints (e.g. conservation of mass and energy, the laws of thermodynamics, evolutionary theory etc.). Using the ideas developed in this reconceptualization of economic theory we explore the implications for international trade and myriad public policies associated with the ethical, environmental, and economic aspects of sustainability.

Required Text:

- 1) *Ecological Economics: Principles and Applications* by Herman E. Daly and Joshua Farley

Supplemental Reading: See Course web site for additional material.

NOTE: As a 3000 level class this course can be enrolled in by upper level undergraduate students and graduate students. Graduate students will be responsible for all of the work (listed below) that the undergraduate students are responsible for; however, in addition to that, they will be required to prepare and present a powerpoint summarizing the information in an instructor approved book related to the course.

METHOD OF EVALUATION: *Grades for this course will be determined as follows*

Exam #1 (Thursday April 14th)	(week 4)	15%
Exam #2 (Thursday May 12th)	(week 8)	15%
Exam #3 (Last day of class)	(week 10)	20%
Lab Exercises (4 @ 10% each)		40%
Attendance and participation		10%

Total		100%

COURSE CALENDAR AND READING ASSIGNMENTS (weeks 1-10)

Week 1: Philosophical Foundations

Economics as traditionally taught is often referred to as neo-classical economics. This is the economics that is built upon the ideas of Adam Smith. Market failures such as public goods, common property, and externalities have been recognized and defined by neo-classical economists. However, the significance of these market failures is increasingly being recognized as more important than previously believed. Here we explore the development of a significant reconceptualization of economic theory that imposes scientific constraints in ways that more seriously addresses these recognized market failures. *Readings Chapters 1-3 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 2: Ecologic Sustainability

Here we will cover the laws of thermodynamics as they pertain to the functioning of ecosystems at a range of scales. We will also look at Stock-Flow resources and contrast them with Fund-Service resources. Renewable and non-renewable resources will be defined and characterized with additional discussion of biotic and abiotic resources. Characterization of ecosystem services and their valuation will also be discussed. *Readings Chapters 4-7 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 3: Microeconomics

The purpose of microeconomics is to understand how decentralized decisions by thousands of independent firms and households are communicated, coordinated, and made consistent through prices determined by supply and demand in markets (e.g. How does the invisible hand really work? – and, Does it really work as Adam Smith claimed?). Here we will explore basic ideas from macroeconomics such as the basic market equation, the law of diminishing marginal utility, the law of diminishing marginal physical product, supply and demand, production functions, monopoly, elasticity of demand, and producer and consumer surplus. *Readings Chapters 8 & 9 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 4: EXAM #1 and Intro to Macroeconomics (Exam #1 Thursday April 14th)

This week has the first exam. Exam #1 will cover material covered in Chapters 1-9 . We explore the ideas of ‘Market Failure’ more deeply. Here we define, characterize, and provide examples of market failures such as public goods, common property, and externalities. Ideas of excludability and rivalness are defined and explored. We apply these ideas first to abiotic resources such as fossil fuels, minerals, freshwater, Ricardian land, and solar energy. Next we apply these ideas to biotic resources in the context of ecosystems and look at stock and flow resources and fund and service resources. *Readings Chapters 10-12 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 5: Intro to Macro Economics

Here we begin a broad overview of the important and relevant ideas of macroeconomics. Basic macroeconomic concepts such as GNP and welfare will be discussed and critically evaluated. *Readings Chapters 13 Ecological Economics: Principles and Applications by Herman Daly and*

Joshua Farley

Week 6: Macroeconomics continued

Explorations of the idea of Money as a Public Good and ideas of Frederick Soddy (Nobel Prize winning chemist) on how Money violates the laws of thermodynamics. We will also explore the positive and normative questions associated with measuring and influencing the distribution of income between nations and within the populations of those nations. *Readings Chapters 14-16 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 7: International Trade

Wrapping our mind around the neo-classical idea of comparative advantage and problems with the theory. The relative roles of Capital, Labor, and Resource Mobility as they pertain to comparative advantage and international relations. Contrasting the ideas and nature of Globalization and Internationalization. *Readings Chapters 17 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 8: Exam #1 and Macroeconomic Policy (Exam #2 Thursday May 12th)

Neo-classical economists argue that the invisible hand guarantees efficient allocation of resources and that technological innovation guided by the invisible hand ensures that economic activity takes place at sustainable scales. Here we explore ideas of efficient allocation, sustainable scale, and just distribution through the lens of our ecological reconceptualization of economic theory. *Readings Chapters 18-19 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 9: Policy Principles for Sustainable Scale, Just Distribution, and Efficient Allocation

Our ecologic reconceptualization of economic theory has many significant and controversial ramifications with respect to regional, national, and international policy development. During the last two weeks of this course we will discuss how to develop policy that serves the goals of sustainability while meeting these design principles: 1) Each independent policy goal will require an independent policy instrument; 2) Have appropriate macro control with minimum sacrifice of micro freedom and variability; 3) Leave adequate margins of errors when dealing with the bio-physical environment; 4) Function via acknowledgement of historically given initial conditions; 5) Conform to principles of adaptive management; and 6) The domain of the policy making institution should be congruent with the domain of the causes and consequences of the problem which the policy addresses. *Readings Chapters 20-23 Ecological Economics: Principles and Applications by Herman Daly and Joshua Farley*

Week 10: Policy Principles for Sustainable Scale, Just Distribution, and Efficient Allocation

Finish up ideas covered in week #9 and review for **Exam #3**