

**ESSP 301 Ecosystem Services:
Economic and Ecological Analyses
Fall 1997**

INSTRUCTORS: Dr. Susan Alexander
Dr. Laraine Lomax
Mr. Forrest Melton

TIME AND LOCATION: T,TH 10:00 - 11:50am
Building 47 Rm 103

LEARNING EXPERIENCE DESCRIPTION:

This learning experience analyzes the services and goods that natural ecosystems provide. Students explore the scientific framework of ecosystem services, their disruption or disturbance, economic and ecological values, methods of analyzing these values, and policy implications. The course will also incorporate the appropriate use of the tools of cost benefit analysis, multiobjective decisionmaking, and environmental impact analysis for applied environmental problem solving. Prerequisites: ESSP 155, 240, 260, 270, 280 or equivalents. Recommended: ESSP 250 or instructor consent.

OFFICE HOURS:

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REQUIRED TEXTS*

Daily, Gretchen, editor. 1997. *Nature's Services: Societal Dependence on Natural Ecosystems*. Washington: Island Press.

Dixon, John, et.al. eds. 1996. *Economic Analysis of Environmental Impacts*. London: Earthscan Publications.

* Additional handouts and articles will be distributed in class.

COURSE LEARNING OUTCOMES

1. Students will be able to identify and describe the fundamental ecosystem services, operating across a wide range of space and time scales, that natural ecosystems provide to human societies.
2. Students will be able to conduct ecological and quantitative and qualitative economic analyses of the value and function of ecosystem services.
3. Students will be able to offer preliminary assessment of the full value of ecosystems and the implications of preserving ecosystem services for sustainable economic development.
4. Students will be able to use analysis and critical thinking skills to evaluate alternative policy proposals and their scientific and economic implications.
5. Students will be able to compose critical evaluations of policy and the implications of the policy on the provision of ecosystem services and on various stakeholder groups.

RELATIONSHIP OF COURSE TO CSUMB GRADUATION REQUIREMENTS AND MAJOR LEARNING OUTCOMES:

This learning experience will address portions of the knowledge and skills necessary to satisfy the following ESSP major learning requirements (MLO 1, MLO 3):

ESSP MLO 1 “Students must demonstrate understanding of what a system is and how a systems approach is used to analyze complex processes.”

ESSP MLO 3 “Students must be able to show how interactions among the spheres of the earth system are involved in local, regional, and global environmental problems, and how an understanding of these interactions can lead to ethical and effective solutions.”

FORMAT AND ASSESSMENT

Class format will combine lecture, discussion, student projects, and field trips / guest speakers.

- Exams: There will be a midterm and a final. These must be taken at the regularly scheduled time. Make-up exams will only be given under extraordinary circumstances.
- Student Projects: A semester-long project will be assigned in class. There will be both an individual and team component to the grade. Project presentations will occur during the final week of class.
- Assignments: These will include short essays, papers, problem sets, etc. Late assignments will not be accepted.
- Field Trips and Guest Speakers: Topics covered on these days will be included on exams and assignments.

Overall performance will be assessed based upon:

Midterm	25%
Final	25%
Project	30%
Class participation and Assignments	20%

TENTATIVE SCHEDULE

Date	Activity	Book Chapters and Assignments
Tues Aug. 26	Introduction to Course & Syllabus "What are Ecosystem Services?" Small group discussion of ideas.	
Thurs Aug. 28	Activity: Arbitration/Stakeholder Debate for Carmel River Dam Discussion: What is a system? How do we compromise services? Sustainability. Why value ecosystem services?	Assignment #1 Due Daily - Chp 1 & 2 In-class position paper
Tues Sept. 2	Introduction to Economic Analysis: Review of economic issues, types of ecosystem values and introduction to methods of valuing ecosystem services; Limitations of ecosystem valuation.	Daily - Chp 3,4
Thurs Sept. 4	Film : "Cadillac Desert: The Mercy of Nature" Agriculture, biodiversity, maintenance of soils, natural control of agricultural pests.	Daily - Chp 6,7
Tues Sept. 9	Town Hall Meeting : Salinas Valley Land and Water Use, Ag vs Dev, Natural vs Ag. Introduce Group Project.	
Thurs Sept. 11	Direct and Indirect Use Value, Non-use Values/ Assessing Impacts: pesticide use, erosion control, productivity loss, etc.	Dixon- Chp 1, 2 DeGroot, Investing in Natural Capital
Tues Sept. 16	Guest Speaker: Daniel Mountjoy Salinas Valley Agriculture	Assignment #2 Due
Thurs Sept. 18	Agriculture cont. / reassessment of Town Hall Meeting. Group Project planning time	Daily - Chp 8,9
Tues Sept. 23	Fisheries and Population Management	Daily - Chp 10, Roughgarden paper
Thurs Sept. 25	Economics of Fisheries Management Use Values of Fisheries / Cost-benefit analysis and project valuation	Dixon- Chp 3
Tues Sept. 30	Monterey Bay Aquarium Field Trip	Assignment #3 Due
Thurs Oct. 2	Local / Global Fisheries Issues	Daily - Chp 11
Tues Oct. 7	Local and Global Econ / Policy Issues; Sustainability Review for Midterm	Clark/ Costanza - Ecological Economics
Thurs Oct. 9	Midterm	
Tues Oct. 14	Fall Break	
Thurs Oct. 16	Fall Break	

Tues Oct. 21	Climate Change and Biogeochemical Cycles: Climate Stability	Daily - Chp 5 IPCC Report
Thurs Oct. 23	Non-use Values, Economic Analyses of Climate Change: Global Warming, Sea Level Rise, etc.	Turner, Investing In Natural Capital
Tues Oct. 28	Watershed , flood control mitigation, aquifer replenishment / (Guest: Stamm)	Daily - Chp 13,18
Thurs Oct. 30	Economic Analysis of watershed systems: eco-eco analysis methods	Krysanova, Investing in Natural Capital
Tues Nov 4	Biodiversity / Option value Limits to Economic Measurement of Environmental Impacts	Daily - Chp 14,16 Dixon- Chp 7
Thurs Nov 6	Ocean Resources: Monterey Bay National Marine Sanctuary Natural History (guest lecturer - Maris Sidenstecker)	Assignment #4 Due
Tues Nov 11	Big Sur Natural History Forest resources: existence and quasi-option value, bequest value. Techniques for Valuing Environmental Impacts	Daily - Chp 12,17 Dixon- Chp 4 and Case Study (1): Nepal Forest Development Project
Thurs Nov 13	Tourism; Big Sur	Daily - Chp 15 Dixon- Chp 5 and Case Study (7): Eco- Ecol analysis of Bonaire Marine Park
Tues Nov 18	Guest Lecturers : Ed Demars, Jim Hekkers	
Thurs Nov 20	Project Day Peer Feedback	Assignment #5 Due
Tues Nov 25	Use / Non-use values (con't) Policy and Resource Management: Economic Incentives for Environmental Improvement	Costanza et. al. Nature, 1997
Thurs Nov 27	Thanksgiving	
Tues Dec 2	Project Presentations	
Thurs Dec 4	Project Presentations	
Tues Dec 9	Fynbos Ecosystem Ecology / Economics	Final Projects Due Daily- Chp 19
Thurs Dec 11	Review, Wrap-Up, Evaluations Debate of Costanza paper and Meadows / Pimm responses	Daily - Chp 20 Costanza et. al. Nature, 1997 Pimm, 1997
Tues Dec 16	Final Exam	