NREM 601 Economic Analysis for Natural Resource Management

Justification:

The NREM M.S. degree is an interdisciplinary program for students seeking to develop management skills in managing natural resources and the natural environment. It is a new core course in the proposed modified M.S. degree program. We anticipate an enrollment of 10 – 15 students. The objective of the course is to provide an economic framework for assessing natural resource management issues.

Students will enter the course having taken, at minimum, one course in the principles of economics (NREM 220 or equivalent). They will become conversant on natural resource economic principles and issues and understand some key methods of economic analysis. They will exit with skills that allow them to understand and put into perspective applied economic analyses concerning projects and policies in natural resources management. They will be able to more effectively work on team projects involving economics. Student performance will be evaluated on comprehension of the readings using examinations, on team performance in presenting a case study, and on ability to analyze using economic tools as demonstrated in the student paper.

The textbook being considered is used in undergraduate natural resource economics courses and is appropriate considering that most students will have little formal training in economics. We plan to supplement the textbook with case studies, to show students how to apply economic concepts and principles to real situations. NREM faculty proposed to teach the course has done research on topics pertinent to the course and will develop both short and extensive case studies. Where the faculty does not have expertise, case studies developed elsewhere have been identified.

The course instructor(s) should have formal training in natural resource economics or research experience on natural resource economics topics. Three faculty interested in teaching this course, Dr. Richard Bowen, Dr. Catherine Chan-Halbrendt, and Dr. John Yanagida are all experienced faculty active in research on natural resource economics issues. Bowen is a resource economist with extensive experience in agricultural, water, and land economics issues. Chan-Halbrendt is on sabbatical leave at the Cambridge University taking courses in natural resource economics and is interested in international natural resource economic issues. Yanagida has become more involved in natural resource economics issues since the formation of NREM, especially in forestry and forestry-related economic issues,
NREM 601: Economic Analysis for Natural Resources Management

Course Description:

This course is designed to introduce students with little formal training in economics to an economic framework for assessing natural resource and environmental management issues. The first part of the course introduces key issues and concepts in natural resource economics. The second part of the course teaches the economic methods and concepts used to analyze natural resource economic issues. The third part consists of readings and case studies which apply the economic approach to the management of natural resources. The course will help students understand the behavioral sources of environmental problems and provide a foundation for developing and assessing innovative management and policy solutions.

Instructors: We plan to team teach this course and/or use guest lecturers in order to utilize the experiences of NREM faculty in case studies. Current faculty proposed as potential instructors are Richard Bowen, Cathy Chan-Halbrendt, and John Yanagida.

Prerequisite: NREM 220 or equivalent


Course Outline:

I. Important Issues in Natural Resource Economics

This introductory section of the course will review important concepts and issues in natural resource economics, to include optimal resource use rates, sources of natural resource mismanagement, preservation vs. extraction, property rights, role of benefit-cost analysis, land-use issues, natural resources accounting, and the modeling resources services. Additional readings will expose students to current issues in natural resources economics not covered in the textbook.

Readings: Field, Chapters 1, 2 and additional reading(s) on current issues in natural resources economics.

II. Economic Principles and Contemporary Natural Resource Economics

This section of the course will give the students the key economic theory and methods used in natural resource economics. Important concepts to be covered include willingness to pay, public vs. private goods, discounting, opportunity costs, marginal cost analysis, static vs. dynamic efficiency, natural resource rent, externalities, intergenerational equity, and government vs. market failure. A public policy framework for natural resources will be presented, to include key criteria used in policy analysis, basic policy instruments (incentive-based and direct control), and will cover the concepts
of market vs. government failure. The section will conclude with the principles of benefit-cost analysis and basic applications.

Readings: Field 3 – 8; additional reading on partial budgeting.

III. Applied Natural Resource Problems and Case Studies

*Forestry and Agricultural Economic Issues:* timber harvesting from public forests, forest harvest decisions, carbon sequestration, productivity of agricultural inputs;

Readings: Field 12, 13, 16 and readings supplemental to case studies.

Potential case studies: (1) the economics of growing cattle under koa in Hawaii; (2) carbon trading under the Kyoto Protocol; (3) benefit-cost analysis of the proposed South Kona Agricultural Irrigation System.

*Land and Water Economics Issues:* social efficiency in land use, land markets and prices, land use and “takings,” water law, interbasin transfers, water pricing, investing in water supply systems; in-stream flow protection.

Readings: Field 14, 15 and readings supplemental to case studies.

Potential case studies: (1) protection of agricultural lands in Hawaii using the findings of the 2004-5 Hawaii Agriculture Working Group; (2) economic instruments for managing water in Egypt based on a USAID study.

*Outdoor Recreation, Wildlife and Biodiversity Economic Issues:* demand for and rationing of outdoor recreational uses, pricing of access to public parks; eco- and agri-tourism, wildlife ecology and human institutions; economics of sport hunting; wildlife restoration and predator control; Endangered Species Act, economic benefits of preserving endangered species; cost-effective biodiversity preservation; economic incentives and habitat preservation.

Readings: Field 17, 18, 19 and readings supplemental to case studies.

Potential case studies: (1) congestion pricing of the Hanauma Bay nature reserve; (2) dam construction and salmon habitat destruction in the Pacific Northwest, using a Grand Coulee Dam and Columbia Basin case study prepared for the World Commission on Dams.

*Preservation and Natural Resource Decisions in Developing Countries Economics:* role of resources in economic development; natural resource accounting; management of resource rents; land reform; project evaluation; incentives and political power; insecure property rights; deforestation and subsistence agriculture.

Readings: Field 20, 21 and supplemental readings
Grading:  
25% Exam 1 (Parts I and II)  
25% Exam 2 (Part III)  
30% Case Study Presentations  
20% Student Paper

Case Study Presentations: Students will be organized by teams, with each team updating, improving the content of, and presenting in class one of the case studies assigned for the course.

Student Paper: Students will select a topic in consultation with the instructor(s) and write a 20 page paper that applies an economic framework to analyze a natural resource management issue.