ECON 290: ENVIRONMENTAL ECONOMICS

Professor Devon Garvie, 344 Dunning Hall
Office hours: Mondays 1-2pm or by appointment
email: garvie@econ.queensu.ca
Course website: http://econ.queensu.ca/pub/faculty/garvie/econ290/290Home.html; will also use onQ website

TA Tyler Goddard
Office hours: TBA

COURSE OVERVIEW

This course provides an introduction to the theory and practice of environmental economics. It is designed for students with an introductory microeconomics background interested in environmental issues. The aim of the course is to show that environmental economics provides a powerful set of analytical tools for understanding the nature of and designing solutions to environmental problems. Teaching methods include direct instruction using lectures and cooperative learning using small and large group activities.

LEARNING OUTCOMES

On successful completion of this course, students will have a basic understanding of key principles and basic methods in environmental economics. Students will be able to

- apply basic algebra and graphical analysis in the context of economic analysis of environmental valuation, issues and policies
- communicate why it is important to include nature in economic models, how economists value nature, and the process and results of economic analysis of environmental issues and policies through a variety of oral, written, analytical and graphical methods
- identify and apply appropriate economic models to critically analyse real-world environmental problems and policies

COURSE EVALUATION

Small group learning activities	12%
Large group learning activities	20%
Quizzes	28%
Final exam	40%

COURSE TEXTBOOK

Barry Field and Nancy Olewiler. (2015) *Environmental Economics*, 4th edition. McGraw-Hill.

A hard copy or digital rental can be purchased at the Campus Bookstore or the publisher's website. The fourth edition is substantially revised and provides the best coverage of course material. I strongly recommend against purchasing used 1st or 2nd editions of the text.

ATTENDANCE

Although there is a course text, this course is NOT a textbook course. Lectures are the primary source of course material hence lecture attendance is necessary for successful completion of the course. Lecture material posted on the website does not fully represent material covered in lecture. If you miss a lecture, please ask to borrow a classmate's lecture notes.

IN-CLASS QUIZZES

Two 40-minute quizzes are worth 28% of your final grade; your top score is worth 18% and your other score is worth 10%. **Tentative** quiz dates are Mon, Oct 3 and Mon, Nov 7. There are no make-up quizzes. To avoid a grade of zero on a missed quiz, you must provide official documentation explaining your absence; the Queen's University Off-campus Physician's Form must be used to document medical reasons. When a student has acceptable documentation, the other quiz and final exam will be worth 24% and 44%, respectively.

IN-CLASS LEARNING ACTIVITIES

The course includes six graded in-class learning activities in either small groups of 2-3 students or large groups of 5-6 students.

Four small group learning activities will be held; these are 15 to 20-minute activities. The first small group learning activity is on Mon, Sept 26; activity dates will generally be announced one class prior to the activity. During these activities, small groups will complete and submit answers to assigned questions. Two out of four answer sheets will be graded (randomly) using letter grades and are each worth 6% of your final grade. The remaining two sheets will be graded using pass/fail. A fail will be given for missing, incomplete or unacceptable work; a final grade penalty of 1% for one fail and 3% for two fails will be applied.

Two large group learning activities will be held; these are 70-minute activities. Individual preparation for these activities is required BEFORE class. During these classes, large groups will prepare, write and submit a 750-word memo. Submitted group work for each activity is worth 10% of your final grade. Grading of large group work will be a combination of instructor, peer and self-assessment. A grade of zero will be assigned to a missed large group learning activity.

Large group activities include a Jigsaw Game (**tentative date** Thurs, Oct 6) and a Policy Memo class (Thurs, Dec 1). Students will be assigned to groups for the Jigsaw Game. Prior to game class, each group will decide which member is responsible for becoming an expert on each of the specified measurement methodologies. At the beginning of game class, experts will meet and discuss their methodology in expert groups. Next, experts will return to their home groups to present their methodology. A benefit measurement challenge will then be posted. Each group will draw upon their expertise to write and submit a memo to the Environment Minister recommending how to best solve the challenge. Students will choose groups for the Policy Memo class. Background reading will be assigned prior to the memo class. At the beginning of the Memo class, an environmental policy challenge will be posted. Each group will write and submit a policy recommendation memo to a political leader on how best to solve the challenge.

> **All graded in-class learning activities will be held under exam conditions hence use of the internet, cell phones, class notes, books, articles, etc., is not permitted. Exceptions include approved calculators and a typed copy of your individual preparatory work for large group activities.**

Other short (ungraded) small group learning activities such as pair/share will be held throughout the course.

ACADEMIC INTEGRITY

Queen's University's Regulation 1 on Academic Integrity will be enforced for all coursework; large group work may be submitted to turnitin. Students are responsible for familiarizing themselves with the regulation and ensuring that all coursework conforms to the principles of academic integrity. Actions which contravene the regulation will be sanctioned.

PRACTICE PROBLEMS

Practice problems and solutions are posted on the course website. The purpose of these problem sets is to increase your understanding of course material by providing you with an opportunity to work through problems based on concepts and models learned in class. The incentive to do practice problems carefully is that quiz and exam questions are strongly correlated with these problems.

COURSE OUTLINE WITH APPROXIMATE TIMES

In the first few weeks of the course, we will examine interlinkages between the economy and the environment, the nature of environmental assets and how and why markets fail to allocate environmental assets efficiently.

I. INTRODUCTION AND OVERVIEW (½ WEEK)

- economy-environment interlinkages

II. COMPETITIVE MARKETS AND MARKET FAILURE (1½ WEEKS)

- competitive markets, theory of externalities, First Welfare Theorem, nature of environmental assets

Next, we will learn how economists value nature, in theory and practice, and an economic model of environmental quality.

III. ENVIRONMENTAL BENEFIT MEASUREMENT (2 WEEKS)

- economic approach to valuing environmental assets
- Jigsaw Benefit Measurement Methodologies Game

IV. ECONOMICS OF ENVIRONMENTAL QUALITY (1½ WEEKS)

- modeling pollution mechanisms, abatement and damage costs, efficient pollution control

Using the environmental quality model, we will learn economic policy solutions to environmental problems. The course will culminate in the Environmental Policy Memo Class.

V. ENVIRONMENTAL POLICY ANALYSIS (5½ WEEKS)

- modeling pollution decisions, property rights and the Coase Theorem, regulatory instruments (standards, taxes and subsidies, marketable permits) and instrument choice
- Regulatory Instruments Game
- Environmental Case Study, if time permits

VI. ENVIRONMENTAL POLICY MEMO CLASS (½ WEEK)

READING LIST

Additional readings will be posted for large group learning activities.

** Highly recommended * Recommended

FO Barry Field and Nancy Olewiler. (2015). *Environmental Economics,* 4th ed. McGraw-Hill Ryerson.

I. INTRODUCTION AND OVERVIEW

** N. Hanley, J. Shogren and B. White. (2007) ch.1, "Economy-environment interactions" in **Environmental Economics in Theory and Practice**, 2nd edition, Palgrave MacMillan.

** P. Dasgupta. (2008) **"**Nature in Economics**,"** *Environmental and Resource Economics*, 39:1-7.

II. COMPETITIVE MARKETS AND MARKET FAILURE

** **FO**, ch.3, "Benefits and Costs, Supply and Demand."

** **FO**, ch.4, "Economic Efficiency and Markets."

** D. Anderson. (2010) ch.7, "Energy" pp. 155-170 in **Environmental Economics and Resource Management**, 3rd edition, Routledge.

* J. Carlin. (2002) "Environmental Externalities in Electric Power Markets: Acid Rain, Urban Ozone, and Climate Change." *Energy Information Administration*.

III. ENVIRONMENTAL BENEFIT MEASUREMENT

** **FO**, ch.7, "Benefit-Cost Analysis: Benefits."

** N. Hanley, J. Shogren and B. White. (2001) ch.3, "Valuing the Environment and Natural Resources" in **Introduction to Environmental Economics**, Oxford University Press.

** D. Pearce et. al. (2006) Cost-Benefit Analysis and the Environment, pp. 86-88, 93-98, 106-124, 156-165. OECD.

* Fisheries and Oceans Canada. (2007) "Estimation of the Economic Benefits of Marine Mammal Recovery in the St. Lawrence Estuary."

IV. THE ECONOMICS OF ENVIRONMENTAL QUALITY

** **FO**, ch.5, "The Economics of Environmental Quality."

* **FO**, ch.6, "Framework of Analysis."

** **FO**, ch.9, "Criteria for Evaluating Environmental Policies."

V. ENVIRONMENTAL POLICY ANALYSIS

(A) PROPERTY RIGHTS AND THE COASE THEOREM

** **FO**, ch.10, "Liability Laws, Property Rights, Moral Suasion, Green Goods," pp. 162-175.

(B) REGULATORY INSTRUMENTS

** **FO**, ch.11, "Standards."

** **FO**, ch.12, "Emission Taxes and Subsidies."

** **FO**, ch.13, "Transferable Emission Permits."

* H. Demsetz. (1996) "The core disagreement between Pigou, the profession, and Coase in the analyses of the externality question." *European Journal of Political Economy*. 12, 4, 565-579.

(C) INSTRUMENT CHOICE

** **FO**, ch.14, "Compliance Costs, Uncertainty, and Information."

** C. Hepburn. (2006) "Regulation by Prices, Quantities, or both: A Review of Instrument Choice." *Oxford Review of Economic Policy.* 22, 2, 226-247.

VI. ENVIRONMENTAL POLICY CASE STUDIES (if time permits)

** **FO**, ch.16, "Water Pollution Control Policy" or ch.17, "Air Pollution Control Policy.

ECONOMY-ENVIRONMENT INTERLINKAGES