Chapter 1: Introduction

I. Go over the syllabus (first two pages)

II. Structure of the course and tentative lecture schedule (later two pages)

1. The human society is concerned with sustainability, i.e. whether the current economic growth, or even the current level of economic well being, can be sustained forever. If not, what can we do about it?
2. To ensure sustainability, the best we can do can be decomposed into two parts:
   (1) Do our best in the current generation. That is, we should be efficient in utilizing resources and environment in achieving the objectives of the current generation.
   (2) Balance the welfare of different generations. What is the best for our generation may not be the best for later generations. That is, efficiency in our generation is not enough to achieve sustainability
3. Economics has traditionally focused on the current generation efficiency. This is also our focus in the course. Economic principles and analytical methods are the main tools that we will use in the course.
   (1) Thus, we will review some basic economic principles, mainly efficiency measures, including static and dynamic efficiency.
   (2) However, general economic principles ignore many characteristics that are specific to resource and environmental problems. These are market failures, including property rights, externalities, public goods, discounting, etc. We will review how economic principles are used to deal with these issues.
   (3) Government policy is always the major issue in dealing with environment and resource. We will review the major tool that is used in policy evaluation and formulation, that is, the cost-benefit analysis, and how these tools can be applied to resource and environmental problems.
4. Then we deal with efficiency in resource extraction and utilization.
   (1) Again, we first deal with economic principles that are special for resource use.
   (2) We then talk about specific resources, including non-renewable and renewable resources, such as minerals, water, forests, wildlife.
5. Then we deal with efficiency in environmental protection.
   (1) First, we talk about the economic principles in pollution control.
   (2) Then we talk about specific pollution problems, including water and air pollution.
6. Finally, we talk about intergenerational efficiency

III. On the issue of sustainability: two views

1. Pessimistic view:
(1) Dates back to Thomas Malthus (1798): Population grows exponentially. Even if new technology is invented, more people will die. Dismal science
(2) Resource will be used up as population grows continuously. I.e., technological innovation cannot keep up with population growth.
(3) Or pollution becomes too heavy and the environment cannot be cleaned up. Laws of Thermodynamics: low entropy -> high entropy. Earth will be filled with goods of high entropy which cannot be consumed.
(4) We have to cut back growth, even cut trade. Some argue that we should reduce the standard of living. Story: the long-lived monk.

2. Optimistic view:
(1) Population growth will slow down as economy grows. German and some North European countries have negative population growth. S-shaped logistic curve.
(2) Technology growth is faster: they push back or away the limits.
(3) Growth can be sustained.

3. Which is right? What can we do about it if the current way of living cannot be sustained?

III. Class objective: To provide an understanding of the role of economics in analyzing resource and environmental issues and policies.

1. To grasp a set of useful economic tools.
2. To learn how to approach a resource and environmental problem. Don't want you to memorize economic models or solutions. Rather, given a problem, you should learn how to analyze it, what kind of methods may be useful, and what incentives you should consider. Same thing for policy analysis.

IV. Why need a separate course of resource and environmental economics?

1. Different from natural sciences: they ignore people and incentives of society. Example: fishery in Western U.S.: biologists can work out the best way of breeding fishes. But economic incentives are crucial in determining whether there is water in river.
2. Different from economics: there are many things special about res/env econ.
   (1) market failure
   (2) dynamics and irreversibility
   (3) inter-disciplinary: needs natural sciences
   (4) valuation of the environment: market price is not available for many resources, such as Yellow Stone national park. They are not exchanged through the market. There does not exist even the shadow value. Measurement is a big issue in resource and environmental economics.
3. Resource and env. econ. enables us
   (1) To better understand why problems exist
      (i) Acid Rain
      (ii) Global warming: the Greenhouse Effect
      (iii) Toxic Waste
To better understand why problems persist
(i) There have been a large number of legislative and judicial policies put into place to deal with environmental and resource problems. Numerous Clean Air Acts (LA pollution) and the Superfund legislation
(ii) Why have past policies failed to resolve existing problems? Are the policies too lenient? (In fact, we will find that in many cases the policies were too strict.)

To better evaluate future policy directions
(i) Should the U.S. join the treaty on global warming (Kyoto conference in 1997)?
(ii) Should the Crop Retirement Program (CRP) be based on environmental characteristics of the soil? What characteristics?
(iii) Should the government subsidize water markets to reduce water use and water pollution?

4. In particular, for many env/res problems, we will
(1) identify the problem:
(2) analyze the problem:
   (i) why have they arisen
   (ii) whether the market can solve the problem by itself
(3) analyze current government policies and suggest appropriate policies
(4) Note:
   (i) Economic considerations are not the only, or even necessarily the most important, factor in making natural resource or environmental decisions.
   (ii) Economics is a tool to be used in guiding policy making, but not an end in itself.

V. What is economics?

Since we will be using economic tools a lot, we need to know what is economics and why it is a useful tool for env/res issues and policy.
1. Economics is the study of allocation of scarce resources.
2. It is not business, or profit maximization.