

# Syllabus: Environmental economics, Winter 2016

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**Course synopsis:** This course explores the economic foundations for management and public policies of environmental problems such as natural resource depletion and pollution control. The emphasis of this course is on basic concepts and introduction of analytical tools for policy decision-making as well as generating research in environmental and natural resource economics. In particular, the course aims to deepen students' understanding of (i) why resource and environmental problems have occurred from the economic point of view, and (ii) what kind of policy tools, which are provided by economics and management science, can usefully be implemented to solve these problems.

As required knowledge, students should be familiar with microeconomics and mathematics at the level of courses offered in the 1st year at IDP/PMPP. Softwares to be used are “microsoft excel” for solving some numerical and optimization problems that arise in environmental and natural resource economics.

**Optional references for the course:** There is no required textbook. However, for those who are willing to study more deeply, the following textbooks are recommended and all of these are reserved in the library.

- Conrad (2010)—good reference for resource allocation problems and excel programming
- Field and Field (2006)—introductory level of environmental economics, which covers many recent case studies such as global warming
- Kolstad (2010)—intermediate level of environmental economics
- Hanley et al. (2007)—advanced level of environmental economics
- Varian (2007)—reference for the concept of public goods, market failure and negative externality

## Grading policy:

- Problem sets and quizzes, 50%
- In-class final exam, 50%

**Problem sets and quizzes:** A problem set is assigned every other week, and easy quizzes may irregularly be given in a class when some nice question pops up in my mind.

## Course structure:

### Topic 1 Introduction to environmental economics

—Suggested readings

- Chapter 1 in Kolstad (2010)
- Chapter 1 in Conrad (2010)

### Topic 2 Renewable resource depletion

—Suggested readings

- Chapter 3 in Conrad (2010)
- Chapter 9 in Hanley et al. (2007)

### Topic 3 Non-renewable resource depletion

—Suggested readings

- Chapter 5 in Conrad (2010)
- Chapter 9 in Hanley et al. (2007)

### Topic 4 The concept of social efficiency in environmental economics

—Suggested readings

- Chapter 4 in Kolstad (2010)
- Chapter 8 in Field and Field (2006)

### Topic 5 Public & environmental goods, negative externality and market failure

—Suggested readings

- The sections of “public goods, negative externality and market failure” in Varian (2007),
- Chapter 5 in Kolstad (2010)

Topic 6 Property rights and environmental standards for pollution control

—Suggested readings

- Chapter 6 in Kolstad (2010)
- Chapters 11 in Field and Field (2006)

Topic 7 Environmental policy of economic incentives I: Tax & subsidy for pollution control

—Suggested readings

- Chapters 12 in Field and Field (2006)
- Chapter 8 in Kolstad (2010)

Topic 8 Environmental policy of economic incentives II: Marketable permits for pollution control

—Suggested readings

- Chapter 13 in Field and Field (2006)
- Chapter 9 in Kolstad (2010)
- Cason and Gangadharan (2006) and Cason and Plott (1996).

Topic 9 Economic experiments of “marketable permits” (Students will play a role of sellers and buyers for marketable permits of pollution in economic experiments.)

—Suggested readings

- Chapter 2 in Hanley et al. (2007)
- Solow (1993)
- Dixit and Pindyck (1995)

## References

Cason, T. N. and Gangadharan, L. (2006). Emissions variability in tradable permit markets with imperfect enforcement and banking. *Journal of economic behavior and organization*, 61:199–216.

Cason, T. N. and Plott, C. R. (1996). EPA’s new emission trading mechanism: A laboratory evaluation. *Journal of environmental economics and management*, 30:133–160.

Conrad, J. M. (2010). *Resource economics*. Cambridge university press, 2 edition.

- Dixit, A. K. and Pindyck, R. S. (1995). The options approach to capital investment. *Harvard business review*, 73(3):105–115.
- Field, B. C. and Field, M. K. (2006). *Environmental economics*. McGraw-Hill/Irwin.
- Hanley, N., Shogren, J. F., and White, B. (2007). *Environmental economics in theory and practice*. Palgrave macmillan, 2 edition.
- Kolstad, C. C. (2010). *Environmental economics*. Oxford university press, 2 edition.
- Solow, R. M. (1993). An almost practical step toward sustainability. *Resources policy*, 19(3):162–172.
- Varian, H. R. (2007). *Intermediate microeconomics: A modern approach*. W. W. Norton & Company.