Environmental and Resource Economics

Course level: M.Sc.
Course type: Lecture plus tutorials
Contact hours per week: 3 hrs. lecture course, 1 hr. tutorial (3/1 SWS)
ECTS: 6 credit points

Lecture course

Lecturer: Prof. Timo Goeschl, Ph.D.
Email: goeschl@eco.uni-heidelberg.de
Office hours: Tuesdays, 17:00 – 18:00 (appointments via Sekretariat)
Lecture hours: Mondays, 13:00 – 15:30
Classroom: Seminarraum 215, Bergheimer Str.20

Tutorials

Tutor: Daniel Heyen, Dipl.-Math.
Email: heyen@eco.uni-heidelberg.de
Office hours: TBA
Tutorial hours: Tuesdays, 16:00 – 18:00, every other week
Classroom: Seminarraum 215, Bergheimer Str.20

Course Content

A recent World Bank study found that the total cost of air and water pollution in terms of both health and non-health impacts shaves around 6 percent from China's GDP. Germany spends public subsidies to the tune of 0.6 percent of GDP in order to boost renewable energy sources. And a few years ago, Rafael Correa, the president of Ecuador, solicited bids from the international community to establish a fund of $3.6 billion in order to compensate Ecuador for not drilling for oil in the Yasuni National Park (only $13m were raised). These three examples highlight the complex, but also substantial linkages between economics and the natural environment. Developing a graduate level understanding of some of these linkages is the objective of this course.

This course in environmental and resource economics offers the tools and concepts to think conceptually and analytically about the management of society's natural environment. It is targeted at a postgraduate audience with solid foundations in micro, macro, and mathematics. Its research questions are inherently dynamic in nature: How quickly should the Earth's oil reserves be depleted? What is the optimal speed of converting the Amazon rain forest into agricultural land? What is the optimal path of a carbon tax until the year 2100?

The course is divided into three parts. In Part I, you will acquire the analytical tools for tackling dynamic problems using optimal control theory. In Part II, we address issues of long-term optimality and sustainability of society's interaction with the natural environment. This

provides the intertemporal reference point for Part III, which looks at issues of valuation and implementation (instrument choice).

Readings

One key text that the course will rely on is:

Perman, R., Y. Ma, M. Common, D. Maddison, and J. McGilvray (2011): *Natural Resource and Environmental Economics. 4th edition*. Addison-Wesley

Other useful readings will be referred to in the lecture.

Particular features

MOODLE The course benefits from an e-learning platform (moodle) on which much of the tutorial material etc. is available. Students need to have a URZ account to access web-based resources. More information at: http://elearning2.uni-heidelberg.de/. The password to access the course is 'Malthus'.

ERASMUS This course is offered in English as part of the Department's course options for ERASMUS students.

Assessment

Assessment for this course is in the form of a 2-hour exam.

Preliminary schedule

Week	Date	Lecture Topic
1	Oct. 13	Introduction: Skeptical environmentalists and Neo-Malthusians
2	Oct. 20	Mathematical Foundations I: Modeling environmental dynamics
3	Oct. 27	Mathematical Foundations II: Optimal control theory
4	Nov. 3	The efficient and optimal use of natural resources (ch. 14)
5	Nov. 10	Non-renewable resources: Optimal extraction (ch. 15)
6	Nov. 17	Stock pollution problems (ch. 16)
7	Nov. 27	Renewable resources: Optimal management (ch. 17)
8	Dec. 1	Accounting for natural resources and the environment (ch. 19)

Week	Date	Lecture Topic
9	Dec. 8	Valuing the environment (ch. 12)
10	Dec. 15	Irreversibility and risk (ch. 13)
11	Jan. 12	Pollution control: Targets (ch. 5)
12	Jan. 19	Pollution control: Instruments (ch. 6)
13	Jan. 26	Pollution control with imperfect information (ch. 7)
14	Feb. 2	FINAL EXAM