Environmental & Resource Economics

Course title - Intitulé du cours	Environmental & Resource Economics
Level / Semester - Niveau /semestre	M1 / S2
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	SALANIE - HERRERA - MASSOL
Lecture Hours - Volume Horaire CM	30
TA Hours - Volume horaire TD	0
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

François Salanié
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Olivier Massol, Center for Energy Economics and Management, IFP School
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Office: Not decided. Meeting after prior appointment by email.

Course's Objectives - Objectifs du cours :

This course is divided into three parts. Each of them will be taught by a dedicated instructor.

The first half of the course analyzes environmental problems as examples of what is bound to happen when some markets are missing. It is mainly theoretical, but nevertheless offers strong guidelines for the design of public policies. From these principles, one can derive insights on how to manage externalities or public goods, and when taxation, markets for rights, or other instruments, should be used. Applications: fisheries and biological systems, water management, global warming.

The second part of the course we will explore two questions that are important when evaluating environmental policies: valuation of mortality risk and of future consequences. The first concerns how much it is worth spending to reduce risks to life and limb and the second concerns how much it is worth spending now to reduce future harms. For example, the social cost of carbon is the present value of the monetarized damages caused by one more ton of CO2 emitted today. We will analyze a case study in class, and it will be followed by the construction of your own case study. You will be asked to present it to your peers, and to write a report on it.

The third part of the course introduces the field of energy economics. After defining key concepts in energy markets, the course highlights the essential characteristics of the coal, oil, gas and electricity sectors as well as the issues associated with the introduction of renewable energy sources (e.g., solar, wind, biomethane). In particular, the course examines how the sectors' economics are deeply transformed by the transition towards sustainable energy sources. Regarding hydrocarbon resources, the presentation clarifies the economics of depletable resources (e.g., the canonical model by Hotelling, the role of OPEC) and introduces the specific economic problems of resource-rich nations. The course then reviews the economics of network-based energy industries and discusses the main issues observed in the power and gas sectors. Lastly, the course concentrates on the environmental dimension and addresses the contemporary debates pertaining to transformation of energy production and use to shed light on the performance of climate policies and environmental regulation.

COURSE OUTLINE

1) Environmental Policies (F. Salanié), 15 hours
   a) What happens: open access, externalities, public goods
   b) What we should aim at: the missing market fable
   c) What we should do: optimal policy instruments
   d) Applications.

2) Environmental Instruments and health risks (D. Herrera), 7.5 hours

   a) Cost benefit Analysis and Valuing mortality and valuing morbidity risk
   b) A case study on cost benefit analysis
   c) Building your own case study

3) An introduction to Energy Economics and (O. Massol), 7.5 hours
   a) Introduction
   b) The global oil and gas markets and the economics of fossil fuels
   c) The essentials of electricity generation
   d) The economics of existing (i.e., electricity, gas) and emerging (e.g., CO_2, H_2) network-based energy industries,
   e) Interactions between energy and the environment

Prerequisites - Pré requis :

Good understanding of intermediate microeconomics.

Grading system - Modalités d'évaluation :

The first part of the course ("Environmental Policies") will be evaluated by a mid-term exam that will take the form of a combination of a written exam and problem sets (the exact format will depend on whether campus, in person, teaching will be the norm).

The second part ("Environmental Instruments and health risks") will be evaluated by student presentations in class and report.

The thirdpart ("Energy Economics") will be evaluated by a report.

Lecture attendance is mandatory for parts 2 and 3 and active class participation is expected.

Bibliography/references - Bibliographie/références :

Students will be informed about the required reading at the start of the course and will in addition to any textbook consist of published scientific articles. Lecture notes, required readings, except textbooks, and any exercises will be made available through the Moodle course page.

Distance learning – Enseignement à distance :

Depending on the situation, distance learning may be implemented. If necessary, it can be a mix of "Standard lectures", "Interactive virtual classrooms", "Recorded lectures" (videos), with the support of a Chatroom/Forum, and online exercises may complement evaluation tasks described above under "Grading".