**Economics of natural resources**

## Prof. Alessandro Varacca

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course introduces students to the most relevant topics in natural resources and environmental economics. The course will touch on some of the most pressing arguments debated both at the scientifical and the political level. The main topics of the course include: the optimal use of renewable and non-renewable resources; the economics of pollution and environmental damage; the economic evaluation of environmental assets.

At the end of the course, students will be able to:

* Understand and apply economic models for the study of renewable and non-renewable resources;
* Understand the differences and trade-offs between the main potential approaches to incentivise the reduction of pollution and, more generally, to limit environmental damage;
* Apply methods for evaluating environmental goods and, more generally, goods that do not have a market;
* Apply assessment tools to some significant case studies for the management of issues related to environmental sustainability.

***COURSE CONTENT***

1. Introduction: environmental economics and sustainability:

* The relationship between the economic system and the environment;
* Specific aspects of environmental economics;
* Environment and economic system;
* Circular economy and sustainability.

1. Economics of well-being and the environment

* Optimal allocation of resources (outline);
* The net social benefit;
* Social efficiency and resource exploitation;
* Minimisation of social costs;
* Public goods and externalities;
* Property rights and the Coase Theorem;
* Limits of the Coase Theorem.

1. Economic evaluation of environmental assets:

* The value of non-market goods;
* Direct and indirect evaluation methods;
* Evaluation methods and their evolution (contingent valuation, travel cost, hedonic pricing, choice experiments, experimental auctions);
* An application example: the Exxon Valdez case.

1. Economic policy tools for the environment

* The concept of the Pigouvian tax
* Environmental standards
* Other environmental policy tools (fines, standards)
* Cost effectiveness
* Negotiable pollution permits
* The economics of climate change and mitigation strategies

1. Economics of renewable resources:

* Definition of renewable resources
* Optimal use of renewable resources under different conditions (maximum profit, free access)
* The price of renewable resources
* The water economy case
* The renewable energy case

1. Economics of non-renewable resources:

* Definition of non-renewable resources;
* Optimal use of non-renewable resources;
* The measure of scarcity and the price of non-renewable resources;
* The case of fossil fuel energies and mineral resources.

1. Environmental policies

* International environmental conventions
* The European Union environmental policy
* The European Union climate policy
* Environmental aspects in the Common Agricultural Policy

***READING LIST***

For each topic covered, the lecturer will provide reading list information and supplementary material during the course. Furthermore, students may find the following textbooks helpful (although not strictly necessary):

MUSU I. (2003), Introduzione all’economia dell’ambiente. Il Mulino, Bologna.

TURNER R.K., PEARCE D., BATEMAN I. (2003), Economia ambientale. Il Mulino, Bologna.

***TEACHING METHOD***

The course is developed using the following didactic tools and teaching materials:

1. lectures in which the main concepts of the course are presented and developed, always supplemented by application examples. During lectures computer presentations are used, which will be made available to students.
2. Analysis of cases relating to specific environmental problems.
3. Subject to availability, external experts may be invited to give seminar presentations on specific relevant topics (this will strictly depend on how far along the agenda the class will be by the time these talks are scheduled).

***ASSESSMENT METHOD AND CRITERIA***

The final exam has the same procedures for attending and non-attending students and consists of a written test lasting 120 minutes structured around open-ended questions. The questions concern both the more descriptive parts of the course and those relating to economic analysis. Students may be asked to carry out short exercises, on the basis of those carried out in class, or to comment on data in the form of a table or graph. The scores attributed to the single questions may vary according to the test.

The assessment aims to provide a sufficiently precise idea of the student's overall level of preparation on the entire programme and to help the lecturer understand both the students’ reasoning skills and their mastery of the economic analysis of environmental problems.

***NOTES AND PREREQUISITES***

To understand the topics covered, a basic knowledge of the tools for graphical (and mathematical) microeconomic analysis is required.

Information on office hours available on the teacher's personal page at <http://docenti.unicatt.it/>.