Code: 1589 **Bioenergy Economics**
Degree: 2nd cycle – Bioenergy Systems Engineering
Curricular Year: 1st **Semester Course: 1st**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: José Manuel Osório de Barros de Lima e Santos
Other lecturer(s): Ana Maria Contente de Vinhas Novais and Francisco Ramos Lopes Gomes da Silva
Web Site: http://www.isa.utl.pt/home/node/3920

1. Contact hours:
Lectures 30 **Practicals/Laboratory** 40 **Others** 14 **Total** 84

2. Objectives:

After the course, students should:
- understand the basic economic concepts which are essential for the economic analysis of bioenergy;
- understand the basic and operational concepts and methods of two applied tools for bioenergy appraisal: Benefit-Cost Analysis (BCA) and Multicriteria Analysis (MCA);
- be able to apply these two analytical tools in evaluating bioenergy systems, projects, programmes and policy tools.

3. Programme:

1. An introduction to bioenergy economics
Scarcity, choice and opportunity cost. Competitive market equilibrium. Pareto optimality and compensation tests. Market failure and public intervention. Benefit-Cost Analysis (BCA) Cost-Effectiveness Analysis (CEA), and Multicriteria Analysis (MCA).
2. Benefit-Cost Analysis (BCA) of bioenergy projects, programmes and policy tools
BCA goals. Social BCA versus private profitability of an investment project. Main steps in a BCA. Problem areas for BCA. Valuation and valuation methods: substitution costs, dose-response functions, travel cost, contingent valuation and hedonic pricing. Validity and reliability of methods. Benefit transfers and meta-analysis. Risk and uncertainty in BCA.
3. Biomass: the European and national scenarios
The European scenario: biomass demand increases. The national scenario: electric energy production. Biomass from forestry wastes. The forestry sector and bioenergy uses. Energy stands: forest and agriculture.
4. An applied case-study of BCA to a bionergy project
An introduction to the case-study. Analysis, presentation and discussion of the case-study by students in a seminar environment.
5. Multicriteria analysis (MCA) of bioenergy systems
Multiple goals. Criteria: attributes, goals and targets. Technical versus decisionmaking problems. Efficient frontier and Pareto-optimum conditions. Main methods used in MC decisionmaking.

4. Bibliography:

Main Bibliography

Nick Hanley and Clive Spash (1993). *Cost-benefit analysis and the environment*. Edward Elgar, Akldershot.
Support documents delivered during the classes and case-study sessions.

5. Assessment:

- A final test about the theoretical issues discussed in the lectures (weight 40%);
- Two presentations made by students followed by discussion in a seminar environment (weight 30%).

6. Estimated Workload: 168 Hours
7. Last Update: 21/7/2010