Learning objectives

This (42h and 6 CFU) course intends to offer basic and specialized training in the following areas: a) duality in consumption and production: theory and applications; b) choices under uncertainty.

Contents

Starting from the assumption that students (are supposed to) have already acquired a sound background in basic general microeconomics, the first part of this graduate course intends to provide a comprehensive exposition of duality theory and its applications in modern microeconomics. Consumer and producer optimization (i.e. decision) problems will be analysed in both $R^2$ and $R^N$ dimensions in order to offer theoretical instruments useful for a better understanding of the methods and results of econometric models of consumer demand and production efficiency. The second part of the course will provide a graduate treatment of individual choice under uncertainty including measures of risk aversion, risk spreading and pooling.

Students should bear in mind that

a) Topics such as games and oligopoly form part of the program of another microeconomic course (Advanced Microeconomics) delivered during the second year. In order to avoid useless duplications they are not considered here.
b) Topics such as moral hazard and adverse selection in the field of insurance will be covered in other courses (in particular Economics of Insurance/Economia delle Assicurazioni).

**Detailed program**

**Detailed Content of the Course**

**First part**

Individual consumer behaviour
- Hotelling-Wold identity
- Direct and indirect Utility functions
- Roy’s identity
- Expenditure function and Slutsky decomposition
- Functional forms and estimations
- Distance function and its properties
- Relations between Distance and direct Utility functions

**Producer behaviour**
- Direct and indirect Production functions
- The Cost function and Slutsky decomposition
- Profit functions (unrestricted; restricted)
- Functional forms and estimations
- Input and output Distance function and their properties
- Measurement and estimation of production efficiency

**Second part**
- Notion of uncertainty
- Choice under uncertainty and Axioms
- Properties of the utility function, risk premium and measures of risk aversion
- Measure of risk
- Comparative statics under uncertainty
- Production under uncertainty
• Price and technological uncertainty

**Prerequisites**

Intermediate mathematics including constrained optimization in \( \mathbb{R}^N \) (Calculus I and basic matrix algebra) and basic microeconomics. Students are recommended to avoid "maths for economists" textbooks.


**Teaching methods**

Frontal class lectures. Individual exercises with class solutions. Two hours of weekly small group tutorials will be organized.

On line material available (E-Learning course website).

At the beginning of the course an entry test paper will be organized.

**Assessment methods**

Final written exam (6 questions with 3 exercises; each question includes subquestions). No differences between attending and non-attending students. No mid-term exam. Due to the change of the lecturer, no past papers are available.

**Textbooks and Reading Materials**

References

**For Duality**

R. Cornes, *Duality and modern economics*, Cambridge University Press, 1992 (Chapters 2 – 8)

Or equivalent chapters in graduate textbooks

**For Uncertainty**


Basic online material with exercises will be provided (please visit the E-Learning platform of the course). Language Italian and English.
Semester

I semester starting 10/12/2018.

Teaching language

Italian