Course: Microeconomics 1

Faculty: Johannes Gierlinger

Term: Fall

E-mails: johannes.gierlinger@uab.cat (Johannes Gierlinger) and alberto.ramirez@uab.cat (Alberto Ramirez, your TA)

Web page: https://sites.google.com/site/jgierlingerecon/

Office hours: Tuesday 14:00-15:00 office B3-184 + the office hours with your TA.

Important dates: Midterm on October 20. Final exam on December 1.

Grading: 40% midterm exam, 40% final exam, 20% attendance and problem sets.

Description:

Our first task will be to find a model of the individual which is consistent with observed choices. Starting from general notions of preference and behavioral consistency, we move to the market environment to understand consumer behavior. We will discover that we can adapt some of our previous results to understand how profit-maximizing firms react to prices. Once we understand both sides of the markets, we can determine market-clearing prices given preferences, endowments, and the firm's technology. Finally, we bring all sides together to study the nature of competitive equilibria and their welfare properties.

Objective:

Starting from first principles, this course should enable you to study individual choices and market outcomes.

Outline:

1. **Rational Behavior, Choice, and Market demand**
   Consumption set, preferences, properties of preferences, utility representation, properties of utility functions, examples. Budget constraint, utility maximization problem, competitive demand, properties and computation on some examples. Differential characterization of the demand for a differentiable utility function.
2. **Production and Firm Behavior**
   Production set, transformation function, production function, examples. Competitive behavior, profit maximization, profit function, supply function,

properties. Differential characterization of the supply for a differentiable transformation function. Cost minimization, cost function, demand function, properties. Relationship between profit maximization and cost minimization.

3. **Pure Exchange Economies**

   Definition of competitive equilibrium, properties. An example with two commodities-two consumers: the Edgeworth box. Differential characterization of competitive equilibria. Existence of competitive equilibria. Feasible allocations, Pareto optimal allocations. Existence of Pareto optimal allocations. Differential characterization of Pareto optimal allocations. Pareto optimality conditions in terms of marginal rates of substitution. First and second theorems of welfare economics.

4. **Production economies**

   Private ownership economies, definition of competitive equilibrium, properties. Differential characterization of competitive equilibria. Existence of competitive equilibria. Production economies, feasible allocations, Pareto optimal allocations. Existence of Pareto optimal allocations. Differential characterization of Pareto optimal allocations. Pareto optimality conditions in terms of marginal rates of substitution and marginal rates of transformation. First and second theorems of welfare economics.

References:

Kreps, David M., «Microeconomic Foundations I: Choice and Competitive Markets», Princeton University Press, 2012.

Mas-Colell, A., M. Whinston and J. Green, « Microeconomic Theory », Oxford University Press, 1995.

Rubinstein, A., «Lecture Notes in Microeconomic Theory: The Economic Agent», Princeton University Press, 2012. Free download at http://gametheory.tau.ac.il/arielDocs/

Detailed Syllabus

Week 1

Presentation of the course (outlines of the program, references) – Choice among alternatives. Consumer choice: consumption bundle, consumption set. Basic properties of preferences relations (monotonicity, continuity, convexity). Examples (linear preferences, Leontief preferences), indifference curves, lower / upper contour sets. Utility function, existence of a representation, examples (linear, Leontief, Cobb-Douglas utility functions) and their properties (monotonicity, continuity, differentiability, quasi-concavity).

Weeks 2 and 3

Prices – Consumer Theory: budget constraint, examples and basic properties – Utility Maximization Problem (UMP), demand correspondence, an example with infinitely many solutions (i.e., linear utility functions) – Basic properties of the demand: existence and uniqueness of a solution, demand function. Weak axiom of revealed preference with a budget set. Walras' law – Characterization of the demand in terms of First Order Conditions (F.O.C.), geometric interpretation – Characterization of the demand in terms of Marginal Rates of Substitution (M.R.S.), analytical interpretation.

Weeks 3 and 4

Producer Theory: production plans (inputs/outputs), production set, transformation function, production function, examples – Basic properties of a production set (non-emptiness, closedness, possibility of inaction, impossibility of free-production, free-disposal, irreversibility, convexity, increasing/decreasing/constant returns to scale). Profit Maximization Problem (PMP), iso-profit lines, supply correspondence, profit function – An example with infinitely many solutions (i.e., constant returns to scale). Basic properties of the supply: existence, uniqueness of a solution, supply function.

Week 4

Producer Theory: Characterization of the supply in terms of First Order Conditions (FOC), geometric interpretation – Characterization of the supply in terms of Marginal Rates of Transformation (MRT), analytical interpretation. Producer Theory: Additional properties of the supply correspondence and the profit function – The law of supply. Cost Minimization Problem (CMP), isoquant, cost function, demand of inputs.

Week 5

Producer Theory: Basic properties of the demand of inputs (existence and uniqueness of a solution) – Characterization of the demand of inputs in terms of First Order Conditions (FOC), geometric interpretation. Relationship between profit maximization and cost minimization problems, proof – Relationship between supply and demand of inputs in terms of derivatives of the cost function, proof.

Week 6

Reviews and questions for the Midterm Exam.

Week 7

Midterm

Week 8

Pure exchange economies: allocations, feasible allocations, basic properties of the set of feasible allocations (non-emptiness, closedness, boundedness, convexity) – The Edgeworth box – Notion of competitive equilibrium and its basic properties. Additional properties of competitive equilibria (Walras Law) – Characterization of competitive equilibria in terms of First Order Conditions (FOC) and Market Clearing Conditions – Characterization of competitive equilibria in terms of Marginal Rates of Substitution and Market Clearing Conditions.

Week 9

Pure exchange economies. Two theorems on the existence of competitive equilibria: statements and comments – Notion of Pareto optimal allocation – Pareto optimal allocations in the Edgeworth box: the contract curve. Pure exchange economies. Characterization of Pareto optimal allocations in terms of the maximization problem of one consumer under appropriate constraints – Characterization of Pareto optimal allocations in terms of First Order Conditions (FOC) – Characterization of Pareto optimal allocations in terms of Marginal Rates of Substitution. Pure exchange economies. Contracts curve. First and Second Welfare Theorems: Proofs and applications.

Week 10

Private ownership economies: definition. Allocations and feasible allocations. Competitive equilibrium and its basic properties – Characterization of competitive equilibria in terms of First Order Conditions (FOC) and Market Clearing Conditions – Characterization of competitive equilibria in terms of Marginal Rates of Substitution, Marginal Rates of Transformation and Market Clearing Conditions. Production economies. Notion of Pareto optimal allocation – Characterization of Pareto optimal allocations in terms of the maximization problem of one consumer under appropriate constraints – Characterization of Pareto optimal allocations in terms of First Order Conditions (FOC). Characterization of Pareto optimal allocations in terms of Marginal Rates of Substitution and Marginal Rates of Transformation – First and Second Welfare Theorems: statements and comments.

Week 11

The one-consumer, one-producer economy.

Production economies. Sufficient conditions for the compactness of the set of feasible allocations: comments and counterexamples – Existence of Pareto optimal allocations: Proof – Pareto optimality in terms of the maximization of an appropriate welfare function with weights

Week 12

Final Exam