

# Microeconomics

## Module 3, 2022-3

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### Course information

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**Course Website:** <https://my.nes.ru>

**Instructor's Office Hours:** By appointment

**Class Time:** TBA

**Room Number:** TBA

**TAs:** TBA

### Course description

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This is the third course in the micro sequence at NES. It is devoted to general equilibrium theory, which studies market clearing prices and quantities in perfectly competitive markets, in a setup that minimizes exogenous variables. After covering the basic theory, we will proceed to equilibrium under uncertainty, and then to market failures.

Overall, the purpose of the course is to familiarize the students with workhorse models in general equilibrium theory and techniques that are utilized in the analysis of these models.

### Course requirements, grading, and attendance policies

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There will be weekly homework assignments (%20) and a final exam (%80). Following the general policy of NES, students are entitled for a make-up exam if they have missed the final with a valid reason or if they have failed in the final. The difficulty of tasks and the grading scheme in the make-up are likely to be different than those in the final.

### Course contents

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<u>Lecture</u>	<u>Topic and Related Reading in the Textbook</u>
1, 2	2 x 2 Exchange Economy (Chapter 15.B)
3	One-Consumer, One-Producer Economy (Chapter 15.C)
4, 5	2 x 2 Production Model (Chapter 15.D)
6	Existence of General Equilibrium (Chapter 17.B, C)

- 7, 8 Basic Welfare Properties (Chapter 16.B - F)
- 9, 10 Equilibrium Under Uncertainty: Basic Setup and Concepts (Chapter 19.B - D)
- 11 Complete and Incomplete Asset Markets (Chapter 19.E, F)
- 12 Imperfect Information (Chapter 19.H)
- 13, 14 Externalities and Public Goods (Chapter 11.B, C, and, if time permits, Chapter 11.D, E)

## **Description of the course methodology**

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If external conditions permit, the instructor will use the traditional methods in a classroom (i.e., a whiteboard, a marker and verbal discussions). Otherwise, we will have online classes. In either case, students are encouraged to participate in lectures with questions and comments.

## **Course materials**

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### **Required textbook:**

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

### **Additional/Optional reading:**

Kreps, D. , *Microeconomic Foundations 1: Choice and Competitive Markets*, Princeton University Press, 2012.

## **Academic integrity policy**

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Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.

## **Sample tasks for course evaluation**

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“Pareto optimality” is the most widely used notion of efficiency in economic theory. Question 1 below provides two alternative definitions of this notion, and asks you to prove the equivalence of these two definitions.

**Question 1.** A feasible allocation  $x$  is said to be weakly Pareto optimal if there does not exist a feasible allocation  $y$  such that each consumer strictly prefers  $y$  to  $x$ . In turn, a feasible allocation  $x$  is said to be strongly Pareto optimal if there does not exist a feasible allocation  $y$  such that each consumer deems  $y$  at least as good as  $x$ , while at least one consumer strictly prefers  $y$  to  $x$ . It is clear that if an allocation is strongly Pareto optimal, then it is also weakly Pareto optimal. Show that the converse also holds if consumers strictly prefer more to less, and if their preferences can be represented by a continuous utility function. In other words, under these assumptions, an allocation is weakly Pareto optimal if and only if it is strongly Pareto optimal.

In the second part of this course, our focus will be on economic exchange under uncertainty. The simplest model of exchange under uncertainty is known as the *Arrow-Debreu* model. According to this model, trade takes place before the resolution of uncertainty but all other activities (such as consumption and delivery of the goods) take place after the resolution of uncertainty. Thus, each consumer purchases a consumption plan that specifies the amount of various goods that she will receive in each state. Consumers finance their purchases by selling their state contingent endowments. In equilibrium, the markets must clear and each consumer must choose an optimal consumption plan, given the price vector and her endowment. Question 2 below clarifies an important feature of the structure of equilibrium: if consumers are risk averse, and if the total endowment in the economy does not vary with states, then consumers will fully “smooth” their consumption across states.

**Question 2.** Consider the Arrow-Debreu model as described above, with the states  $s=1,\dots,S$ . Suppose that there is no aggregate uncertainty in the sense that the sum of consumers' endowments does not depend on  $s$ . Assume further that consumers have strictly increasing, strictly concave and state-independent expected utility functions. Moreover, each consumer assigns the same probability  $\pi_s$  to state  $s$ . Show that in equilibrium, each consumer  $i$  must select a consumption plan  $x_i = (x_{i1}, \dots, x_{iS})$  such that  $x_{is} = x_{is'}$  for every pair of states  $s, s'$ .