MICROECONOMIC THEORY I 2020

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Objectives. This class combins the first two out of four parts of the Ph.D microeconomics sequence. The class has two objectives.

(1) The primary objective is to introduce you to the foundations of microeconomic theory. The class is divided into two main parts:
- The first part is devoted to single agents and consists of the choice theory, the consumer theory, firm theory, methods of comparative statics, the decision theory under uncertainty, and risk. Although most of you have seen the elements of the consumer's and the firm's theory in either your undergraduate or master's education, our approach is going be very different from what you know. We are going to be much more formal and analyze things at much more fundamental, deep level. For example, in your undergraduate class, you would start the consumer theory with writing down the consumer problem, i.e., utility maximization given the budget constraint. Here, we derive the consumer problem from the basic choice theory and formally prove when observable choices of the consumer can be represented (or interpreted) as the utility maximization problem. For the great majority of you, the latter two topics will be completely new. The goal of the comparative statics is to provide you with a basic set of mathematical tools to analyze the effects of the change of parameters on the variables of interests in a whole range of problems across all areas of economics. In the last part, we study foundations of the expected utility model and various uncertainty related behaviors.

- The second part idevoted to studying economic allocations in a society. We spent at least half of the course talking about allocations in the Walrasian economy, including their feasibility, efficiency, equilibrium, etc. The rest of the class will be devoted to allocations in other problems, including matching. Most of the material will be new to you (unless you have taken the graduate course before).

(2) The second, and more universal, objective of this course is to introduce you to the formal approach to the economic argument. The class is proof-based and most of the lecture is going to proceed in the rhythm of definition-theorem-proof-example. You will learn how to read the proofs and how to carefully write them.

Because the topics are either new, or approached in a novel way, and because most of you haven't seen a proof-based class before, many of you will find that it is a difficult class, perhaps the most difficult course you have ever taken. It is essential that you allocate a sufficient amount of time to study for this course, and that you study in a right way. You can find some advice how to do it below.

Prerequisites. I assume that you have all taken or otherwise are familiar with the material covered in the math refresher course ECO1011, L0101 Mathematics and Statistics for PhD and MA Doctoral Stream Students.

Course organization. The course has the following elements

- Recorded lectures (online async) organized in 11 modules. The modules will be released as we move through the semester.
- Tutorial - online sync, Thursdays 2-4pm EST. The first tutorial will take place on 24th September. The tutorials will be devoted to the solutions to problem sets. The tutorials will be recorded
- Webinar/office hours - online sync, Tuesdays and Thursdays 9-10am+ EST (if we need, we will stay for longer than 1h). The first meeting will be on September 10, 9am. I may use this time to discuss some more difficult topics, perhaps address issues that appeared on Piazza. Otherwise, feel free to ask me any questions you want (it will work better, if you post them earlier on

Piazza so that I can prepare.) Piazza discussion board - This term we will be using

- Piazza for class discussion. Rather than emailing questions, I encourage you to post your questions on Piazza. The questions can be posted under your name or anonymously (to your classmates, not to me) and, together with answers, will be visible to all of your classmates. I will check Piazza regularly. If you want to ask a question or add a comment about a video lecture, please specify the name of the video and the time of the video to which your question pertains.

- Study groups: One of the main problems of the online world that we live in is the lack of interactions between students. Everybody that I know who went through the first-year of economics PhD will certify that study groups are extremely important. Hence, during the first week of class, I want you to form groups of size 3-5. The main purpose of the group is to work together on problem sets. Each group should meet (online, I guess) at least once a week to discuss the problem set.

- Readings: I will provide two types of lecture notes: handwritten OneNote notebook and typed pdf. The required textbook is Microeconomic Theory by MasCollel, Whinston and Green (MWG for short). A more detailed description of the topics together with required readings can be found on the Quercus course website.

- Assessments: The grade for my part of the class will consist of 40% for midterm, 40% of final exam and 20% for problem sets.
    - Problem sets: There will be regular weekly problem sets, with posted and due dates listed on Important dates. Each problem set consists of 5-6 questions plus some questions that are called Extra. Except for PS6 and PS11, all the other problem sets must be submitted Crowdmark on Wednesdays by midnight; they will be graded, and the grade will belong to all members of the group. Each group needs to submit answers to each problem separately and only the non-Extra problems need to be

submitted. Individual problems will be graded with a binary grade: 0 or 1.

– Midterm and final exam will take place online. Both exams will be open-book (so you can use your materials, analog or digital), but you won't be allowed to communicate with each other. The midterm will take place during the allocated class time on 29 October, 9-11am EST. Midterm will cover the material from modules 1-6, final exam will cover modules 7-11. The format of midterm and final exam will be the same: 4 questions, 2h to solve them. The question and the time allocated will be very similar to the questions that I will write for comps.

I will post past midterms on Quercus. You can also find the past comps (but I don't remember where - either through the library or some departmental site).

Online sync elements will take place on BP Collaborate, MS teams or some other tool, depending on what is most convenient. **All online sync meetings will be recorded!**

How to study for this class. I want to emphasize - this is a difficult class. I expect that you will spend at least 3h+ a day working on this course. Here is some advice how to do it effectively and how to know whether you understand the material:

- Ask questions. Whenever you don't understand something on the video, stop, go to Piazza and write questions during the lecture. Almost of the time, if you have a question, others students also are confused. For those rare occasions that you are the only confused person, your question will allow other students to catch breath and refresh their notes. This is a graduate class - if I don't hear any questions, I am going to assume that everything is clear and continue writing. And I can write fast.

- Talk to me during the office hours. If you want to talk to me but cannot come during the office hours (or the ofice hours are not enough), ask me to find some other time. I will try to make my best to accommodate you. (I am going to be less sympathetic for a request to meet outside of the office hours coming during the last week before midterm and from a student who have never talked to me before.)

- Make sure that you have all the required material. The readings contain strictly more material than the lecture. In the same time, although you are required to read all the assigned material, I find it difficult to imagine a situation that I would ask for a part of material that was not covered during the lecture or the problem set.
- Read all the readings and your lecture notes. Review past lecture notes regularly.
- There is an easy way to check whether you understand the material. Close the book or your lecture notes, and repeat what you have just learned. Can you restate the definition? The theorem? Do you remember the proof? Can you describe an application of the theorem in an example? Can you do it 3 days after you studied them? Do you remember the solutions to the problem set from two weeks before? Etc.
- Work on all problems. Do not worry if you cannot solve it, just try again later, or on the next day, or 3 days later. If you don't solve it before the tutorial, make sure that you understand where and why you were stuck. Talk to me about it.