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Stanford University
Department of Economics
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Econ 51: Economic Analysis II

Instructor:

- Professor Fuhito Kojima, fkojima@stanford.edu, Office Hours: Tuesdays and Thursdays 8:15am-9:00am (at the class location, Building 200-002) and 11:00am-12:00 noon (first at the class location, Building 200-002, and then at Landau Economics Building 239).

Teaching assistants:

Anqi Li (Head TA), anqili@stanford.edu. Sections: TBA, OH: Wednesday, 9-11am, ECON 350

Apoorv Gupta, apoorvg@stanford.edu. Sections: TBA, OH: Wednesday, 11:30-1:30, ECON 350

Peter Troyan, petetroy@stanford.edu. Sections: TBA, OH: Thursday, 5-7pm, ECON 106

Sanaa Nadeem, sanaa@stanford.edu, Sections: TBA, OH: Thursdays 12:15-2:05pm, Building 160, Room B38.

Course description: This course will explore selected topics in microeconomic analysis. These will include decisions under uncertainty, general equilibrium, game theory, and theories of asymmetric information. The theories we will discuss provide the foundation of almost all fields in modern economics, and are therefore essential for almost all upper division courses in economics.

The basic question we are trying to answer in this class is: What happens when economic agents (individuals, firms etc.) interact, either in markets or through other institutions? As we will see the answer to this question depends crucially on what we assume about the form of interaction.

This course (as well as almost all modern economics) heavily relies on math, will require much work, and many of you may find it very difficult. The recommended strategy is to study continuously, use the problem sets to make sure you keep up with the material, and come to me or the TAs at the first sign of trouble. There is also a tutoring service provided by the "Center for teaching and learning (CTL)," which you might find useful (the website is http://ctl.stanford.edu/). Let me emphasize that this course can be very difficult for you, but I will make every effort to deliver the best course I can, so please work hard and do not hesitate to ask for help.

Economics department common course policies: All courses taught in the Stanford Department of Economics are governed by a common set of course management rules. A

document explaining these rules is included on our coursework website, and on the Economics Department website at http://economics/undergraduate/economics-common-syllabus. Please be sure to read this document in its entirety and, if you have any questions, send an email to both me and Joanne DeMarchena (jdemar@stanford.edu), undergraduate administrator at the economics department. Note that this is your responsibility to get familiar with these policies, and failure to do this does not constitute grounds for exceptions from these policies.

Prerequisites: Econ 50 must be completed before you enroll in Econ 51 (*Axess* will not allow you to enroll otherwise). There are no exceptions for these prerequisites (in particular, you cannot take Econ 50 and 51 concurrently). For more information on prerequisites, please contact undergraduate administrator Joanne DeMarchena (jdemar@stanford.edu).

Since this is a class about microeconomics it will heavily rely on concepts introduced in Econ 50. If you have taken Econ 50 long time ago, it may be useful to refresh your memory with its material, using any of the textbooks listed below. In addition to Econ 50, you should be familiar with multivariate calculus and basic probability theory. In particular, you should be able to take derivatives, know some constrained maximization (e.g. be able to solve $max(log(x) + log(y))$ s.t. $x+y=t$), and be able to solve simple non-linear equations. If you do not have a firm mathematical background, this class will be *very* difficult for you (to help you refresh your memory on these materials, I will have a review lecture on Thursday January 6th).

Class and Exam Schedule: The class meets on Tuesday and Thursday, 9:00-10:50am in Building 200-002. I will start at 9:05am sharp, and there will typically be a five-minute break in the middle of the class. Regular lectures will take place through Thursday, March 3rd. In addition, we will hold a review class on Tuesday, March 8th. There will be no class on Thursday, March 10th.

Sections will be held on Fridays of each week, starting on January 14th. Sections will be used to expand on ideas presented in lectures and to discuss assigned and graded problem sets and exams. We will make frequent use of our coursework website, so please register and choose a section at http://coursework.stanford.edu as soon as possible (note: TA office hours and session rooms and time slots have not been assigned yet. I will let you know immediately when they are assigned by the department). If you want to change sections after you already chose one, please contact the Head TA, Anqi Li.

Please turn off your cell phones and other electronic devices that make sound during the lectures and TA sections. Devices such as laptops are allowed (I understand that some of you may need them for note-taking and other purposes), but please make sure that it does not cause noise.

There will be one midterm exam during class on Tuesday, February 8th (at Building 200-002). The final exam will be on Friday, March 18, 12:15-3:15 (location TBA). There will be no make-up exams, and no early or late sittings for exams.

Problem sets: Problem sets constitute a major part of the course grade, and an even larger part of your learning. There will be six problem sets during the quarter. It will be hard, and sometimes impossible, to understand the material covered in lecture without solving the problem sets, so please take the problem sets seriously. The problem sets are designed to be challenging, so some parts of them will be more difficult than the level of knowledge required for the midterm or final. Thus, not being able to solve all problem sets in full does not necessarily mean that you cannot do well in the exams. I encourage you to work in groups on problem sets, but you should submit your own write-up. Problem sets will typically be posted on Thursdays, and will be due 8 days later, in section. If you are out of town or cannot make it to a section, you can submit your problem set earlier: More specifically, you should submit your problem set to the mailbox of your section TA. No problem set is accepted later than Friday 4:00pm. Late submissions of problem sets will not be accepted, and there are no exceptions for this policy. All problem sets, answer keys, and handouts will be available on coursework after the submission deadline.

Grading: The grade in the course will be based on three components: problem sets, a midterm exam, and a final exam. Problem sets will be graded on a check, check-plus basis, and the lowest-grade problem set will be dropped. It is recommended to submit all problem sets.

The final grade for the course will be a weighted average of the above three components. The weighting system is designed to provide students who did not do well in the midterm an opportunity to do well in the course. For each student, we will calculate two averages. The first will apply weights of 15% to problem sets, 35% to the midterm, and 50% to the final. The second will apply weights of 10% to problem sets, 20% to the midterm, and 70% to the final. Your course grade will be the *higher* of the two. Thus, if you do poorly in the midterm, it will only count towards 20% of your final grade, provided that you do well in the final.

Letter grading is intended to reflect your understanding of the course material. 'A's reflect an understanding of the concepts learned in the course, and an ability to apply those concepts elsewhere. 'B's reflect understanding of the concepts. 'C's are given to students who can solve questions similar to those already appeared in the problem sets. This ability is a minimal requirement to receive a passing grade in the course. Historically in Econ 51, about two percent of the students fail, although I hope that this can be reduced to zero.

Email: I plan to answer all course-related emails twice a week, on Tuesday and Friday nights, and will attempt to answer all emails received by 10:00pm that day. I will not necessarily be able to read or respond to emails in other times. If you think that your question can be addressed by email, this would be the preferred channel for it, as my office can get pretty crowded during regular office hours. Of course, I will also hold regular office hours (see the beginning of the syllabus) for such issues that are hard to address by emails, and necessitate a more interactive dialogue.

I have also set up our class discussion on a new system called Piazzza. You can sign up at http://www.piazzza.com/stanford. The system is highly catered to providing you help in a fast and effective manner from fellow classmates, your TAs, and myself. I encourage you to use this when stuck on a problem than emailing the TAs or myself, as the likelihood of receiving a quick response is higher (but please do not post or answer questions (almost) asking for an answer to a problem set question: Such a question is subject to editing and/or deletion). If you have any problems or would like to send feedback to the team (comprised of Stanford students and alumni), you can email them at team@piazzza.com

Office Hours: As mentioned above, I and TAs have office hours every week. We encourage you to use them without hesitation. On the other hand office hours are scarce resources and our rooms are often very crowded. Thus please make sure to use them wisely. For example, please be aware that (i) office hours are not substitutes for lectures: Do not skip lectures, asking me or TA to explain the lecture slides in the OH instead, (ii) office hours are not substitutes for study groups: You should not count on TAs to walk through the problem sets before your group first try to solve the problems (of course, if you try first and still have a question you cannot solve, then you are more than welcome to ask TAs for help). More generally, please try to understand what you are struggling with and/or what your question is before coming to the OH so that you can get the most out of your meeting in the OH.

As mentioned above, there are other resources to help you such as Piazza and CTL. Use these resources as well as (of course) office hours, to learn the material as efficiently as possible. Give us feedback about how useful these are.

Texts: <u>There is no required text.</u> I will post the slides used during the class on coursework, and I will make sure that they have sufficient information for understanding the material. For some parts of the class I will also post typed lecture notes on coursework. There are three textbooks that cover the same material, but in a less mathematically rigorous way than we will in class. I recommend one of the following textbooks:

- Hal L. Varian. *Intermediate Microeconomics*. 8th Edition. Norton.
- Robert S. Pindyck and Daniel L. Rubinfeld. *Microeconomics*. 7th Edition. Prentice Hall.
- David Besanko and Ronald R. Braeutigam. *Microeconomics*. 4th Edition. Wiley.

These books are excellent background readings and provide more intuition and examples, which is complementary to what we cover in class. I certainly recommend reading the relevant chapters in one of these books as we go through the quarter (relevant chapters for each topic is listed at the end of this syllabus). However, *only* the material I teach in class and those covered in the TA sections are relevant. Therefore, if you really do not want to buy/read any book, you should be fine coming to class regularly and doing the problem sets (if you have an old edition of one of these books, that is fine as well).

All three books listed cover similar material. Varian is slightly more mathematically rigorous than the other two, so may be closer to what we cover in class. The other two are more "chatty" and potentially more entertaining. Many of you already own Besanko-Breautigam from Econ 50, and should be just fine to keep using it, rather than purchase a new book.

Students with documented disabilities: Students who have a physical, psychological, or learning disability, that may necessitate an academic accommodation or the use of auxiliary aids and services in a class must initiate the request with the Student Disability Resource Center (SDRC), not with the instructor. The SDRC will evaluate the request along with the required documentation, recommend appropriate accommodations, and prepare a verification letter dated in the current academic term in which the request is being made. Students should contact the SDRC in the first week of the quarter as timely notice is needed to arrange for appropriate accommodations. The SDRC is located at 563 Salvatierra Walk. Also see http://www.stanford.edu/group/OAE/

Be sure that you, the SDRC, and I have a common understanding, at least two weeks before any examination, of the precise logistical arrangements by which you will be accommodated.

Course outline: I list below the main topics we will cover, the approximate number of lectures we will spend on each topic, and the relevant chapters in each of the books: A more detailed schedule is in a separate handout, also uploaded on Coursework.

1. *Time and uncertainty* (3 lectures): Chapter 5 of Pindyck and Rubinfeld (P-R), Chapter 12 of Varian, Chapter 15.1-15.3 of Besanko and Braeutigam (B-B), and lecture notes.

2. *General equilibrium theory, Externalities, and Public goods* (6 lectures): Chapters 16 and 18 of P-R, Chapters 31, 32, 34, and 36 of Varian, Chapters 16 and 17 of B-B, and lecture notes.

3. *Game theory* (5 lectures): Chapter 13 of P-R, Chapters 17, 27, 28, and 29 of Varian, Chapters 13, 14, and 15.4 of B-B, and lecture notes.

4. *Asymmetric Information - Moral Hazard, Adverse Selection* (2 lectures): Chapter 17 of P-R, Chapter 37 of Varian, End of Chapter 15.3 of B-B, and lecture notes.