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Stanford University  
Department of Economics  
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## Econ 51: Economic Analysis II

### Instructor:

- Professor Liran Einav, [leinav@stanford.edu](mailto:leinav@stanford.edu), OH: Mondays and Wednesdays 8:40am-9:00am (at Bishop Auditorium) and 11:00am-12:00noon (at Landau-Economics 326).

### Teaching assistants:

- Gabriel Hubert (Head TA), [ghubert@stanford.edu](mailto:ghubert@stanford.edu), Sections 4 and 5 (Friday, 10:00am and 11:00am at Landau-Economics 140), OH: Tuesday, 2:30-4:30pm at room 200-203.
- Ryan Lampe, [rlampe@stanford.edu](mailto:rlampe@stanford.edu), Sections 10 and 11 (Friday, 3:15pm and 4:15pm at Landau-Economics 140), OH: Thursday, 3:00-5:00pm at room HerrinT 195.
- Hieu Nguyen, [nguyench@stanford.edu](mailto:nguyench@stanford.edu), Sections 8 and 9 (Friday, 1:15pm and 2:15pm at Landau-Economics 139), OH: Thursday, 5:00-7:00pm at room HerrinT 195.
- Matthieu Rouif, [mrouif@stanford.edu](mailto:mrouif@stanford.edu), Sections 6 and 7 (Friday, 12:15pm and 1:15pm at 160-317), OH: Wednesday, 6:00-8:00pm at Landau-Economics 140.

### Course admin:

- Kelly Carson, [carson@stanford.edu](mailto:carson@stanford.edu), Landau-Economics 252.

**Course description:** The 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 formal models used 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 the following. Suppose there are rational economic agents who interact (either in markets or through other institutions): what will happen? As we will see the answer to this depends crucially on what we assume about the form of interaction.

Although we will try to focus on the economics and to provide some real-world examples that may show the relevance of the concepts we will cover, the course (as most modern economics) heavily relies on math, will require much work, and many of you may not find it easy. 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.

**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 contact me if you have any questions. 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 1A and 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. For more information on prerequisites, please contact the office for undergraduate studies at the economics department.

Since this is a class about microeconomics it will heavily rely on concepts which have been 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.

**Class and Exam Schedule:** The class meets on Monday and Wednesday, 9:00-10:50am in Bishop Auditorium. 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 Monday, March 9. We will hold a review class on Wednesday, March 11.

Sections will be held on Fridays of each week (sections will start on the first week of the quarter, on January 9, with a math review). 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. If you want to change sections after you already chose one, please contact the Head TA, Gabriel Hubert.

There will be one midterm exam during class on Monday, February 9 (at Bishop Auditorium). The final exam will be on Wednesday, March 18, 8:30-11:30am (at Bishop Auditorium). 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 Wednesdays, and will be due nine days later, in section. If you are out of town or cannot make it to section, you can submit your problem set to the course admin, Kelly Carson, at Landau-Economics 252, or by fax (650-725-5702) or e-mail, no later than Friday 4:00pm. Late submissions of problem sets will not be accepted. No exceptions. All problem sets, answer keys, and handouts will be available on coursework after the submission deadline.

**Experiments:** In addition to the regular class assignments, we will occasionally run simple online “experiments”, which will illustrate some of the concepts discussed in lecture, and will serve as the basis for class discussion. While participating in these

assignments is optional, your performance in these experiments will count towards extra points in your midterm grade.

**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, about two percent of the students fail the course, although my aim and hope is 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 until 10:00pm that day. I will not be able to read and 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 gets pretty crowded during regular OH. Of course, I will also hold regular office hours (see in the beginning of the syllabus) for such issues that are hard to address by emails, and necessitate a more interactive dialogue.

**Texts:** There is no required text. I will mostly rely on the material covered in lectures. 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 texts:

- Hal L. Varian. *Intermediate Microeconomics*. Seventh Edition. Norton.
- Robert S. Pindyck and Daniel L. Rubinfeld. *Microeconomics*. Sixth Edition. Prentice Hall.
- David Besanko and Ronald R. Braeutigam. *Microeconomics*. Third 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. However, *only* the material I teach in class is 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.

All three books listed cover similar material, so your best strategy is to choose one and stick to it. 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-Braeutigam 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 or mental impairment that may necessitate an academic accommodation or the use of auxiliary aids and services in a class must initiate a request with the Student Disability Resource Center (SDRC). 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. Please contact the SDRC as soon as possible; timely notice is needed to arrange for appropriate accommodations. The SDRC is located at 563 Salvatierra Walk (phone 723-1066 Voice; 725-1067 TTY; <http://www.stanford.edu/group/DRC>).

**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:

1. *Time and uncertainty* (2 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.