Purpose and requirement

The purpose of this course is to learn advanced topics in econometrics. The course will evolve around two empirical questions: identification and estimation of the effect of human capital variables on earnings (e.g., the return to education, tenure, etc.), and identification and estimation of labor supply models. Other examples will also be considered and discussed. The focus will be on microeconomic data. The prerequisite is Econ 102B.

Evaluation

Problem sets (30%)
Final exam (70%).

Problem sets will usually include:

(a) a theoretical section, with questions on economics and econometrics;
(b) an applied section, with questions on the results drawn from relevant papers in the empirical literature.

Texts

Wooldridge, "Introductory Econometrics", 2nd ed., Thompson South-Western.
Lecture notes, as well as problem sets and relevant articles (all in pdf format) will be available from my website. Other material will be distributed in class.
COURSE OUTLINE
(Note that some topics could be expanded or reduced)

- **A review of the course.**

- **Matrix algebra and econometrics**
  - Operation with matrices and useful properties.
  - Matrix transposition and matrix inversion.
  - Partitioned matrices.
  - Matrix differentiation.
  - The OLS problem with matrix algebra.
  - Statistics and matrix algebra: some useful distributional results.
  - The Gauss-Markov theorem.
  - Inference in the OLS model.
  - Prediction and goodness of fit.
  - Maximum likelihood.

*Readings*
Class notes + Wooldridge Ch. 3-5
Johnston, Chapters 4 and 5.

- **Instrumental variables**
  - Simultaneous equations models
  - The identification problem
  - Measurement error
  - Method of moments estimation
  - Difference tests
  - Overidentification and overidentifying restrictions
  - Application: The economic return to schooling

*Readings*
Class notes + Wooldridge, Ch. 15 and 16.
**Panel data**
- Pooling time-series and cross-sectional data
- Fixed effects
- Random effects
- Dynamic models
- Application: The economic return to firm-specific human capital

*Readings*
Class notes + Wooldridge, Ch. 13-14

**Qualitative response models and limited dependent variables**
- Linear probability models
- Random utility and index function
- Maximum likelihood estimation
- Probit and logit estimation
- Application: High school graduation
- Truncated and censored distributions
- Tobit estimation
- Application: Self-selection and female labor supply

*Readings*
Class notes + Wooldridge, Ch. 17
Common Syllabus Elements for All Economics Courses.

Beginning with Autumn quarter, 2003-04, courses taught in the Department of Economics are covered by a common set of course management policies, laid out in this document. For some years, the Department has been advising instructors to adopt these policies; the current change is to put a default document in place where students can find it. Students are responsible for knowing and abiding by these course policies.

We have several goals in laying out a common set of policies. It frees up students to focus on learning Economics instead of learning course policies. It frees up instructor, TA and staff resources for teaching Economics instead of explaining course policies. It makes the system more uniform so students can think about the content of their studies instead of about the system.

Some of the policies set very clear and sharp boundaries, often because one goal is reducing the transaction costs associated with more discretionary policies. Other policies are designed to rule out behaviors that beginning students don’t fully realize are inappropriate.

I. Attendance
   a. Courses have individual policies regarding class attendance.
   b. Exam attendance

   Exam attendance at the specified time is required. There are a few very specific exceptions to this rule, and if you are requesting one of these exceptions you must email the course instructor, copying the director of undergraduate studies (tbres@stanford.edu). The exceptions, stated below, are health emergencies, deaths in the immediate family, Stanford business that takes you away from Campus, and documented disabilities. There are not exceptions other than for reasons listed below, e.g., not for students who are attending job interviews or beginning jobs or internships before the end of the term, or who for other non-educational reasons would prefer not to be at the University when the exam is scheduled. Since the exceptions are narrow and clear cut, your email asking for an exception should be short and to the point.

   i. Death of an immediate family member at a time when attending services requires you to travel away from campus. Immediate family members are your parents, siblings, spouse, and children.

   ii. Health emergencies where you are unavoidably in the hospital or clinic during the time of the exam. Vaden physicians will certify when students who have health emergencies were seen, by agreement with the Department. That (or similar, if you are in hospital) documentation should follow your email.

   iii. Absence from campus on Stanford business, for example, for athletic competition. Work through the AAC (Ms. Powell) in order to take your exam at the same time (or slightly earlier, if absolutely necessary) as other students in the course but in a different place.

   iv. Disabled students who are working through the DRC may, in some circumstances, take examinations at a different place than the rest of students. See DRC section below.
Students are responsible for making sure, at the beginning of the term, that they can attend the exams. Registering for a course means that you certify that you will be present for the exam (unless one of the explicitly stated exceptions above arises.)

Economics courses enforce the every other seat rule for examinations, and exams are to be taken either in the examination room or the designated overflow room if one is needed.

c. **On Time exam attendance**

   Students who arrive late will have less time to finish, finishing at the same time as other students. Students who, through bad luck or bad planning, appear late for an exam will need to finish at the same time as other students.

d. **Withdrawals and Incompletes**

   Stanford provides an option for students to withdraw from courses to do so; students may withdraw up to the end of the 8th week of classes for any reason. Students may request incompletes after that deadline provided (1) the only work that is incomplete is the course final exam or final paper and (2) there is a health emergency or a death in their immediate family (these are clear cut boundaries, see the precise boundaries under "exam attendance, above.) Students should promptly (once healthy and past initial grieving) work out an arrangement for clearing an incomplete with the Professor. The typical arrangement is taking the final in the same course offered in a later term. The University rules about incompletes, such as that they turn into NP after a fixed period of time, apply here.

e. **No make up exams, exams at second times.**

   There are no make-up exams or exams at second times.

f. **Deadlines**

   Late work, whether problem sets, exams, papers, or other work, does not count for course credit. It gets a grade of zero. No exceptions.

g. **Weighting**

   Weighting different aspects of student’s work is, like the rest of grading, a necessary evil. The relative weights on the different elements course work are set by the instructor. So are the rules that permit (or do not permit) dropping the lowest problem set score. The department has no set weights.

   One department-wide rule is that, if the course permits dropping the lowest problem set score, a student who has entered a course late and missed the first problem set drops that one, not a later one.

h. **Correcting Errors in Grading**

   Errors in grading occur, if very rarely; this section lays out rules and procedures for requesting a correction. The important general rule is that such a request should clearly and succinctly state the unambiguous error you believe has occurred.

   Errors in grading arising from illegible or garbled answers are not subject to correction.

   Students who have been graded incorrectly should petition for a correction in writing to the Professor, copying the director of undergraduate studies (tbres@stanford.edu). Students must not approach either instructor or TA with an oral request before making their written request. Requests should be extremely short and must focus on the specifics of the grading error. Requests should occur within a week of
the work being returned (for example, within a week of the work being placed in the academic office.)

The entire graded work (problem set or examination) should be resubmitted; there is no guarantee that grades will rise, statistically, positive and negative errors in grading are equally likely. If the request arises because you think different students have been graded differently, all the affected students should submit their work as a group (there is no guarantee that only upward adjustments will occur.)

Note that this policy applies only to specific and unambiguous errors, not to such items as disputes over grading policies, protests about the form or content of an examination, or claims of learning not displayed in the work. Requests for a correction which do not state, with particularity and specificity, the error to be corrected will be rejected.

Here is the appropriate form of a request to correct an error grading: “Dear Prof. X: I am a student in your economics 999 course. I believe that the grades on my midterm were added up incorrectly. As you can see from the bluebook I left in your mailbox, I have 25 on each of the four questions, but 73 on the exam. I have not spoken with you or any of the TAs about this, and am copying the DUS on this email. Sincerely, Fred.”

Requests after the end of the term are further limited by the University’s policies. See http://www.stanford.edu/dept/registrar/academic/grades.html

i. Honor Code Issues

The Honor Code is a very important part of Student life, and the Department of Economics takes it seriously. The Department encourages course instructors to fully comply with their responsibilities to honorable students under the Honor Code.

Many instructors and TAs are very offended, to the point of suspecting an Honor Code violation, when students ask for “hints” about future exams and problem sets. Don’t do things (like this) which lead Professors and TAs to think ill of students.

The Department reserves the right to undertake procedures that would catch violations of the Honor Code should any arise, such as photocopying work before it has been returned.

j. Disability Issues

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 Disability Resource Center (DRC), not with the instructor. The DRC 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 DRC in the first week of the quarter as timely notice is needed to arrange for appropriate accommodations. The DRC is located at 563 Salvatierra Walk. Also see http://www.stanford.edu/group/DRC/

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