

**Economics 470**  
**(3 credit hours)**  
**Applied Econometric Analysis**

**Teaching mode: Weekly scheduled synchronous class meetings (zoom:  
<https://unc.zoom.us/j/92388192279>)**

**Syllabus**

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Gardner 208c

Office hours: 2-3 Monday and Wednesday and by appointment (zoom:  
<https://unc.zoom.us/j/98380588222>)

TA: Pulasthi Amarasinghe

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Office Hours: TBD

Midterm 1: Given February 23 and due 25<sup>th</sup> (25%)

Midterm 2: Given April 13 and due 15<sup>th</sup> (25%)

Five to Seven Problem Sets (15%)

In class multiple choice using sakai (two lowest dropped – 10%)

Final Exam: Given May 10 and due 13<sup>th</sup> at 3 PM (25%)

**Recommended Textbook:**

Introduction to Econometrics, 4<sup>th</sup> Edition, Stock and Watson

**Course Computer Software**

Stata: May want to buy student edition in addition to or instead of purchasing the textbook.

**Prerequisites:**

The pre-requisite is Econ 400 (Statistics) with a grade of C or better.

**Course description:**

Econometrics is the application of statistical methods and economic theory to the problem of identifying, estimating, and testing economic models. This course covers concepts and methods used in empirical economic research. Topics include the classical single-equation regression model, multiple regression models, discrete and categorical dependent variables, instrumental variables and longitudinal data. Students will learn the theory and assumptions behind each of the estimation methods so that they can determine the appropriate method for any particular analysis. In the lectures, there will be

many empirical examples using a wide variety of data sets that are either cross sectional or longitudinal. These data sets are large survey data sets that were gathered from the US and countries all over the world and were typically collected so that a specific program or policy could be evaluated. As part of the lecture, the policy or program that was analyzed is presented along with a discussion of the appropriate econometric method that should be used. After the statistical analysis is performed, students can then determine whether or not the results are supportive of the program's objectives.

**Problem sets:**

All problem sets (five to seven over the course of the semester) will involve empirical analysis using data sets in STATA format that we will provide. The empirical analysis will require the student to decide on the appropriate econometric method and apply the method to the data. The student will have to write out the justification for the estimation strategy, present the empirical results, and then discuss the implications of their results. The implications will typically involve an explanation of whether or not a particular policy or program had a statistically significant effect on an outcome of interest such as a child's health, an individual's educational attainment, or commercial real estate return differentials across cities, for example.

STATA is available in computer labs on campus, a student edition can be purchased, and it is available as part of the Citrix virtual computer lab that you can access with your onyen and password. Problem sets are independent work – not a group project. However, it is okay to ask a fellow student about STATA commands, for instance. You should hand in your assignments at the beginning of class the day they are due (typically a week after distribution). Late problem sets (but before answers are posted) will be marked down by 50%.

**Course Outline and Tentative Semester Schedule:**

**Weeks 1 and 2:**

Economic questions and data (Ch. 1)  
Review of probability and statistics (Ch. 2 and 3)

**Weeks 3 and 4:**

Bivariate linear regression (Ch. 4 and 5)

**Weeks 5 and 6:**

Multiple regression (Ch. 5, 6, and 7 plus lecture notes for testing and estimation with heteroskedasticity)

**Week 7:**

Review and midterm 1.

**Week 8:**

Functional form and dummy independent variables (Ch. 8)

**Week 9:**

Instrumental variables for linear models (Ch. 12)

**Weeks 10 and 11:**

Repeated cross sections and longitudinal data methods (Ch. 10 plus lecture notes to cover random effects models and specification tests plus repeated cross sections)

**Week 12:**

Review and midterm 2

**Weeks 13 and 14:**

Discrete dependent variable models (Ch. 11 plus lecture notes for multinomial logit and conditional logit)

**Grading Policy:**

All exams and problem sets will be open book and open notes. All problem sets and tests are graded on a 100 point scale. The final grade is determined by weighting problems sets by 15%, pollanywhere quizzes by 10%, and each exam (two midterms and final) is weighted 25%. Letter grades are determined from the following scale where the grades will be adjusted so that the median score is 88 if the raw score is less than 88.

100 – 93	A
92-90	A-
89-87	B+
86-83	B
82-80	B-
79-77	C+
76-70	C
69-60	D
59 -0	F

**Policy for Missing a Midterm:**

If a student misses one of the two midterms, the weight of that midterm in the course grade will be equally divided between the other midterm and the final exam. An exception will be made for University-approved absences (see <http://catalog.unc.edu/policies-procedures/attendance-grading-examination/>); students with this type of absence may request a make-up examination at a time convenient to both student and instructor. It is unlikely that a student will miss a test since students will be given a generous amount of time to turn in their work.

### **Code of Conduct:**

Students are bound by the Honor Code in taking exams and in written work. The Honor Code of the University is in effect at all times, and the submission of work signifies understanding and acceptance of those requirements. Plagiarism will not be tolerated. Please consult with me if you have any questions about the Honor Code.

### **Counseling and Psychological Services:**

CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: <https://caps.unc.edu> or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.

### **Accessibility Resources & Services:**

UNC-Chapel Hill facilitates the implementation of reasonable accommodations for students with learning disabilities, physical disabilities, mental health struggles, chronic medical conditions, temporary disability, or pregnancy complications, all of which can impair student success. See the ARS website for contact and registration information: <https://ars.unc.edu/about-ars/contact-us>.

### **University Testing Center**

The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit <http://testingcenter.web.unc.edu/>.