ECO 705
Econometric Methods
UNC Greensboro
Fall 2023
Tuesday and Thursday: 1400-1515

**Contact Information**

Name: Chris Swann
Office: 450 Bryan
Email: caswann2 at uncg dot edu

**Course Overview**

ECO 705 is the first course in the PhD Econometrics sequence. In it we will introduce/review some statistical concepts used in econometrics; study the classical linear model and its estimation by ordinary least squares; consider issues such as correlated errors, missing data, and outliers; and introduce causal analysis methods.

**Office Hours**

This semester, office hours will be a mix of Zoom if I am not in the office and my office (450) if I am. For Zoom, let me know you want to meet, and we will set something up. If I am in the office, I have an open-door policy – i.e., if I am in the office and not in the middle of something, I will meet with you – and by appointment. Email is the best way to contact me to make an appointment.

**Learning Objectives**

On completion of the course, students should be able to:

1. understand and apply concepts from mathematical statistics, including probability theory, distributions, and expected value.
2. use statistical estimators and analyze their properties in the context of random sampling.
3. formulate and estimate linear econometric models and interpret the empirical results.
4. adapt econometric models to address different empirical questions.
5. conduct statistical inference through hypothesis testing.

**Texts**

Note: You will use Greene and both volumes of Cameron and Trivedi across multiple courses.

Greene, William H. 2018. *Econometric Analysis, Eighth Edition* Prentice Hall. [Referred to as "G" in the calendar below.]

Greene, William H. 2018. Appendices to *Econometric Analysis, Eighth Edition* Prentice Hall. [Referred to as "G" in the calendar below.]

Cameron, C and P. Trivedi. 2022. *Microeconometrics Using Stata*; Volume I: Cross-Sectional and Panel Regression Methods, Second Edition. Stata Press. [Referred to "CT" in the calendar below.]

An undergraduate econometrics text such as Wooldridge or Stock and Watson

**Software**

We will use Stata in this course. You have (at least) two options for accessing Stata.

You can purchase a license from Stata: https://www.stata.com/order/new/edu/profplus/student-pricing/. For this course, and likely for anything you do, Stata/BE will suffice. That license is $94 per year.

The second option is to use mycloud at https://mycloud.uncg.edu It will suffice for the course, but you will eventually need your own copy for dissertation work because the resource limits are too strict for dissertation work.

**File Storage**

You have two choices in saving files when using mycloud. You have the option of allowing mycloud to have access to your local hard drives (i.e., the hard drive(s) in your laptop or desktop computer), or you can use network storage. (You may have the option to map OneDrive to a drive letter, but that is a terrible thing to do for data sets.)

You do not, however, have access to local network storage by default. The instructions for obtaining storage on the S drive are at https://uncg.service-now.com/kb?id=kb_article_view&sysparm_article=KB0011086

Once you have been allotted space on the S drive, it will be available whenever you log into mycloud – or if you log into computers in the labs on campus.

**Grading**

Grades will be based on homework (40%), a midterm exam (25%) and a final exam (35%).
Homework assignment dates will be announced.

**AI Policy**

I am working on a formal AI policy and will amend the syllabus when that is available.

**Academic Integrity**

Students are expected to be familiar with and abide by the University's Academic Integrity policy (see http://academicintegrity.uncg.edu/). In particular, students *may* be expected to work independently on homework assignments and are expected to work independently on the project.

**Health Concern**

Health and well-being impact learning and academic success. Throughout your time in the university, you may experience a range of concerns that can cause barriers to your academic success. These might include illnesses, strained relationships, anxiety, high levels of stress, alcohol or drug problems, feeling down, or loss of motivation. Student Health Services and The Counseling Center can help with these or other issues you may experience. You can learn about the free, confidential mental health services available on campus by calling 336-334-5874, visiting the website at https://shs.uncg.edu/ or visiting the Anna M. Gove Student Health Center at 107 Gray Drive. For undergraduate or graduate students in recovery from alcohol and other drug addiction, The Spartan Recovery Program (SRP) offers recovery support services. You can learn more about recovery and recovery support services by visiting https://shs.uncg.edu/srp or reaching out to recovery@uncg.edu

**Course Schedule**

This schedule is tentative and subject to change.

| Tentative Schedule | | |
|---|---|---|
| Date | Topic | Reading (Chapters) |
| 8-15 | Course Introduction/Univariate Probability Dist. | G: App. B.1-B.3 |
| 8-17 | Univariate Probability Distributions | G: App. B.1-B.3 |
| 8-22 | Introduction to Stata | CT Chapters 1 and 2; Appendix A |
| 8-24 | Bivariate Distributions | |
| 8-29 | Common Statistical Distributions | G: App. B.5 and B.7 |
| 8-31 | Simulation Using Stata | CT Chapter 5 |
| 9-5 | Samples and Sampling distributions | G: App. C.1 – C.4 |
| 9-7 | Point Estimation | G: App. C.5 |
| 9-12 | Hypothesis Testing | G: App. C.7 |
| 9-14 | Large Sample Distribution Theory | G: App. D.1-D.2.6 |
| 9-19 | Bivariate Regression: assumptions and estimation | Undergraduate textbook |
| 9-21 | Bivariate Regression: goodness of fit and sampling distributions | Undergraduate textbook |
| 9-26 | Bivariate Regression: inference | Undergraduate textbook |
| 9-28 | Simple Treatment Effects Using Regression | Notes |
| 10-3 | Midterm | |
| 10-5 | Algebra of Matrices | G: Appendix A.1 and A.2 |
| 10-12 | Linear Model in Matrix Form | G: Chapter 2 |
| 10-17 | Mechanics of Least Squares | G: Chapter 3: 3.1, 3.2, 3.4 |
| 10-19 | Goodness of Fit and Classical Assumptions | G: 3.5, 4.1 and 4.2 |
| 10-24 | Statistical Properties of OLS Estimator | G: 4.3 and 4.4 |
| 10-26 | Robust Inference | G: 4.5, CT: Chapter 6 |
| 10-31 | Data Issues: Multicollinearity and Missing Data | G: 4.9 |
| 11-2 | Data Issues: Measurement Error and Outliers | G: 4.9 |
| 11-7 | Hypothesis Testing | G: 5.1-5.3, 5.7 and 5.10 |
| 11-9 | Dummy Independent Variables | G: 6.1, 6.2 |
| 11-14 | Dummy Dependent Variable | 17.2.6 |
| 11-16 | Functional Form and “marginal effects:” | G: 6.5 |
| 11-21 | TBD | |
| 11-28 | TBD | |
| 11-2 | Final Exam1530-1830 | |