ED 711 - Applied Quantitative Methods in Education

Spring 2021

Instructor:	Steve Porter	**Time:**	Tu 16:30 – 19:15
Email:	srporter@ncsu.edu	**Place:**	Online (Zoom)
Office hours:	By appointment		

Objectives: This course is primarily designed for doctoral students seeking additional training in quantitative research methods beyond introductory statistics (typically ED 710); I assume everyone in class will be doing a quantitative dissertation. It covers regression analysis, the workhorse of statistics in the social sciences. Most advanced techniques in quantitative methods use regression analysis, or concepts from regression analysis, as a basis. Having a thorough understanding of regression analysis is essential for any quantitative researcher.

Textbook: Note you must use the 7th U.S. Edition, as well as purchase access to MindTap for this course.

- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, Cengage Learning, 2019.

Software: We will be using Stata version 15 or 16 for this course. A temporary Stata license is available for CED doctoral students; please contact the College's IT office. You can also purchase a copy at a discounted rate for graduate students (https://www.stata.com/order/new/edu/gradplans/student-pricing/).

If you plan on a quantitative dissertation, I recommend purchasing at some point either the IC or SE version of Stata. SE allows the use of larger datasets, where "large" is defined by the number of variables, not observations. If you think you might end up using a national dataset, go with SE.

Prerequisites: ED 710 or the equivalent (with my approval). If you have not taken ED 710, please see me immediately.

Given the prerequisite, students taking this course should have a solid understanding of introductory statistics (i.e., ED 710), basic high school math (especially algebra), and some experience with Stata. I have posted lists of Quant I and basic math competencies in Moodle, as well as suggested resources for each topic. If you believe you are lacking in these competencies, I have two recommendations:

1. Engage in some remediation to prepare you for semester. See the recommended resources under "Background material for course" on Moodle for getting up to speed.
2. Take the course at a later date, when you are more prepared.

Of the three areas, the material from ED 710 is the most important. If you are struggling with remembering concepts from ED 710, then you will be faced with the hurdle of relearning ED 710 while learning ED 711 material, which is generally not a recipe for success. I recommend every student in the course read Urdan chapters 1-8, 12 & 13 as a quick review (link to the library's online version is in Moodle).

The math competencies are the next most important area. A regression model is basically an algebraic function, so some simple algebra is required just to understand the notation for the model. Of all the math concepts listed in the Core Competencies, **understanding the intercept and slope of the line is absolutely essential**, as the regression model consists of a single intercept and multiple slopes.

Tentative Course Outline: I can never predict when a class will need more time in a particular area, so I do not have assigned dates for chapters or exams. Assignments for each week will be posted in Moodle. I anticipate 2-3 weeks per topic listed below.

Introduction to regression	Chapters 1 & 2
Multiple regression	Chapter 3
Inference	Chapters 4 & 5
Misc. regression topics	Chapter 6
Dummy variables	Chapter 7
Heteroskedasticity & specification	Chapters 8 & 9

Assessments: All assessments are open-book and open-note, but must be completed without outside assistance.

- MindTap problems sets (30%). These are designed so that you have three attempts for each problem. Be sure to check your answer for each problem rather than waiting to submit all answers at the end (then you will only get one attempt for each problem).
- Take-home midterm on chapters 1-5 (35%). This will be posted at the end of one class and will be due at 4 PM one week later.
- Take-home final on chapters 1-9 (35%). This will be posted at the end of one class and will be due at midnight one week later.

Late assignments will not be accepted, so please plan accordingly.

Final grades will be assigned using this scale:

$97 \leq A+ \leq 100$
$93 \leq A < 97$
$90 \leq A- < 93$
$87 \leq B+ < 90$
$83 \leq B < 87$
$80 \leq B- < 83$
$77 \leq C+ < 80$
$73 \leq C < 77$
$70 \leq C- < 73$
$67 \leq D+ < 70$
$63 \leq D < 67$
$60 \leq D- < 63$
$0 \leq F < 60$

Important Dates:

Wellness day	February 9th
Last class	April 27th
Final exam due	May 4th (by midnight)

Disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Resource Office at Holmes Hall, Suite 304, Campus Box 7509, 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.01) (https://policies.ncsu.edu/regulation/reg-02-20-01/).

Academic Integrity: Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at http://policies.ncsu.edu/policy/pol-11-35-01. Your submission of any test or assignment indicates "I have neither given nor received unauthorized aid on this test or assignment."

Please note this syllabus is subject to change; any changes will be discussed in class.