Instructor

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Course Overview

This primary objective of this course is to extend the basic linear model to deal with outcome variables which cannot be treated as continuous. A secondary objective is to turn students into educated consumers of a variety of advanced quantitative methods used in empirical criminological research. Importantly, this often means understanding what the method cannot do, as much as what it can. As such, this course is will cover several advanced topics in applied econometrics and psychometrics, including models for binary, ordinal, count and censored dependent variables, plus basic panel models. Time permitting, we will consider some other interesting topics including bootstrapping and nonparametric regression. Theoretical foundations of topics will be introduced and developed; however, the emphasis will be on the empirical applications of each topic. In addition to the regular lectures, we will also be using meeting times to discuss empirical papers and go through computer examples in class.

Prerequisites

Proficiency in basic statistics and regression (e.g., the material that covered in CCJS 621) is essential to go forward in this course. If you are not current or proficient, I strongly suggest that you review that material and/or revisit this course at a later point in your doctoral studies. Given the advanced nature of this course, a strong willingness to put in appropriate time and effort to do quality, quantitative empirical research in criminology/criminal justice is also a necessity. This means spending time outside of the lectures and assignments to learn and master the material. If you have questions about this, be sure to speak to me as soon as possible. I will treat this course as a responsibility and opportunity to train future colleagues; thus, I expect you to reciprocate and take this responsibility and opportunity seriously.

Software

I will demonstrate in class and provide examples and support for most applications using Stata. Occasionally, I may also use SAS (and time permitting, R) for some applications. However, you are welcome to use any statistical software you wish to complete the assignments, although I cannot guarantee I will be able to help you with all other packages.
Textbook


This text is required, and the pace of the course will generally (though not entirely) follow at the depth in which the material is covered in this text.

There are two other texts which you may find useful (both in this course and beyond). If you are initially uncomfortable with matrix algebra, the latter of these is written at a less theoretical, more intuitive level, which is substantially easier to read. Though this text is not required, it is strongly recommended if you feel you need a supplementary source of reading:


Additionally, Wooldridge’s homepage has a link dedicated to these texts where you can download the datasets used in the examples, as well as the solutions to some of the exercises: [https://www.msu.edu/~ec/faculty/wooldridge/books.htm](https://www.msu.edu/~ec/faculty/wooldridge/books.htm)

Journal Articles and Additional Readings

Also, as an educated consumer, you should be able to read and understand more quantitatively sophisticated articles relating to the analysis of crime and criminal behavior. Therefore, we will be reading multiple empirical articles, mainly from the *Journal of Quantitative Criminology* (plus several other outlets), in order to see how these methods and concepts are used in practice. I will try to post all articles at least two weeks in advance of our discussing them in class. However, sometimes copyright laws prevent the posting of the actual article. In these cases, you may either download the articles from [www.jstor.org](http://www.jstor.org) or go directly to the journal website.

On certain occasions, I assign other readings from various other sources, in which case I will make them available to you at least two weeks in advance. Also, you will likely find the Stata help manual you used last semester in 621 to be of great help. To remind you, it is:


Class Attendance

All students are expected to attend class regularly and come prepared to participate. While you will not directly lose points for missing class, note that too many absences will affect your participation, and hence, your final grade.
Disability Accommodations

Persons with a documented disability requesting reasonable accommodations should contact me by the second class meeting. We will then work with Disability Support Services (DSS) to make arrangements with you to determine and implement appropriate academic accommodations.

Religious Observances

Any student who anticipates the necessity of being absent from class due to the observation of a major religious observance must provide notice of the date(s) to me, in writing, by the second class meeting. The request should not include travel time.

Late Work and Incomplete Grades

Extensions for assignments of exams will not be given except in cases of a medical or family emergency. Proper accompanying written documentation is required. Any problems that a student encounters must be brought to my attention as soon as possible. Incomplete grades are strongly discouraged and will be given only in situations where (a) a student has completed a majority of the course requirements and (b) shows substantial proof of hardship that necessitates more time to meet those requirements. As noted elsewhere, no late homework will be accepted. In the event of either of the above circumstances, a make-up assignment will be given. To be clear, I have a strong prejudice against the use of “incompletes” to allow for more time to complete the requirements of graduate courses, and I reserve the right to decide on the appropriate extension case-by-case.

Technology in the Classroom

I will pass out a hard copy of my lecture notes each week which you may use to follow along in the lecture, meaning you will have no need for any type of digital device during class. Please do not use your laptops, phones, tablets, etc. during class.

Academic Dishonesty

Plagiarism will not be tolerated in this course under any circumstances. All instances of academic dishonesty will be reported directly to the Honor Council. If you engage in it, I will take the proper actions to ensure that you receive a failing grade in the course and are disciplined by the University to the fullest extent possible.
Grading Criteria

Your final grade for the course will be determined using the following formula:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empirical Projects</td>
<td>40%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Participation</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100%</td>
</tr>
</tbody>
</table>

Notice that the greatest weight is put on the projects, which purposefully corresponds to the mission of the course—to learn to analyze data and interpret results. Additionally, you will be expected to be prepared and participate in each class. Given the advanced nature of the course, this is essential for learning the material. Your final grade will be derived from this percentage (90-100%, A; 80-89.9%, B; 70-79.9%, C; < 70%, F).

Empirical Projects

There will be 4 homework assignments throughout the semester, which will roughly correspond to the length of time spent on topics. Each project will count equally as far as the final grade. The project will be due at the beginning of class on the due date. Late homework will not be accepted and will count as a zero for that assignment. You may, and in fact are encouraged, to discuss solution strategies in groups. However, each student must turn in individually written answers to the homework assignments (this includes your own set of interpretations of any joint results). Solution sets will be made available when the assignments are returned.

Midterm Exam and Final Exam

I will make more information, including the format, available to you as the dates near.

Participation

Though by nature of the material, this course will involve a lot of lecturing, questions and discussion are highly encouraged!! You should do all readings prior to coming to class. Some of these text readings can be dense, so you are encouraged to discuss them with one another if you are having difficulty understanding them. Furthermore, I want you to be obsessive about reading and understanding the journal articles, and I reserve the right to have you lead the discussion in class about one of the articles assigned for that week. Some weeks I will have you write up a summary of the assigned articles, for which your response will count toward your participation grade.
Tentative Schedule

This is an extremely aggressive list of topics which may need to be modified. Thus, I reserve the right to adjust the schedule of topics. Also, time permitting, we may add additional topics, in which instance, I will make sure all assigned reading in done at least two weeks in advance.

September 5 – Class Introduction; Review of OLS and Probability Theory (Reading: Long 1.1-1.3; 2.1-2.7)

September 12 – Binary Response Models I: LPM, Logit (Long 3.1-3.7)

September 19 – Binary Response Models II: Probit, Marginal Effects and Odds (Long 3.8-3.9; 4.1-4.4)

September 26 – Categorical and Ordered Outcome Models (Long 5.1-5.7)

October 3 – Multinomial Outcome Models (Long 6.1-6.10)

October 10 – Median and Quantile Regression (Koenker and Hallock; Buchinsky; Britt)

October 17 – Midterm Exam

October 24 – Censored Normal Dependent Variables I – Tobit Estimation (Long 7.1-7.7)

October 31 – Censored Normal Dependent Variables II – Semiparametric Models (Readings TBD)

November 7 – Sample Selection Models (Readings TBD)

November 14 – Count Data; Poisson and Negative Binomial Regression (Long 8.1-8.7; Berk and MacDonald; Osgood)

November 21* – No Class; ASC Meetings in Atlanta, GA

November 28* – No Class; Thanksgiving

December 5 – Pooled Cross-section and Panel Data; Difference-in-Difference Estimation (Readings TBD)

December 12 – Fixed and Random Effects Models (Readings TBD)

December 19 – Final Exam

* To compensate for the two classes we must miss due to scheduling, I will try to schedule a make-up session at some point during the semester – we will discuss the specifics during the semester.
Additional Readings

Please note this is not a comprehensive additional reading list, and I will supplement it along the semester.

Berk, Richard, and John MacDonald. Overdispersion and Poisson Regression, *working paper*.


