

UAP 5494
Advanced Quantitative Techniques for Urban Research
Professor Casey Dawkins

Professor contact info:

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Office hours:	By appointment
Office location:	201 Wall Street

Course meeting times:	MW 9:00AM - 11:00AM
Location:	Architecture Annex 1

Course Description

This course is designed to provide Ph.D. students and advanced masters students an introduction to the craft of empirical social science research as it is conducted in the fields of urban planning and policy analysis. Emphasis is placed on statistical estimation of causal models using readily-available data. The point of departure for the class will be the linear regression model. Toward that end, we will explore the properties of the linear regression model, discuss the algebraic derivation of the ordinary least squares (OLS) estimator, examine advanced methods of hypothesis testing, and explore the implications of violating the assumptions of the classical linear regression model. We will also examine advanced applications of the regression model, including but not limited to instrumental variables models, limited dependent variable models, panel data techniques, and spatial econometrics. We will focus on advanced techniques appropriate for the analysis of cross sectional and panel data sets.

The goal of the course is to prepare students to be astute producers and consumers of academic research. Students will learn to formulate and test empirical models through hands-on computer exercises and critiques of published academic research.

Prerequisites

The prerequisite for the course is UAP 5224 or an equivalent course providing an introduction to statistical methods, including probability, statistical inference, and statistical estimation. A working knowledge of matrix algebra and calculus is helpful but not required.

Course Requirements and Policies

Grading:

Each student's grade in the course will be determined by their performance on three assignments:

- Problem sets (30% of the student's total grade)
- 2 two peer reviews of published academic research (each review is worth 15% of the student's total grade – 5% is based on the oral presentation and discussion of a selected published paper, and 10% is based on a written evaluation of the selected paper.)
- 1 research paper or proposal (40% of total grade)

Details on each of these assignments will be provided in class.

Policy on Late or Missed Assignments

All work must be submitted by the due date.

Attendance Policy

You are responsible for all material discussed in class.

Special Needs of Students

If you need course adaptations or accommodations due to a disability, if you have any emergency medical information that the course instructor should know about, or if you need special arrangements in the event the building must be evacuated, please consult Professor Dawkins to make necessary arrangements. Virginia Tech procedures regarding students with disabilities are detailed on the following website:

<http://www.ssd.vt.edu/accommodationsmain.htm>.

Policy on Plagiarism and Academic Honesty

The Virginia Tech Honor System is in effect for this course. Please take the time to read this document and make sure that you understand your responsibilities as a student. The Graduate Honor System can be accessed online at <http://filebox.vt.edu/studentinfo/gradhonor/>. The Undergraduate Honor System can be accessed online at <http://www.honorsystem.vt.edu/>. The following statement, taken from the Graduate Honor System, describes the types of violations covered under the Honor System:

All forms of academic work performed by any graduate student enrolled on a part-time or full-time basis under any of the admission categories shall be subject to the stipulations of the Graduate Honor Code. Such work includes, but is not limited to, course work, labwork, thesis or dissertation work, research, teaching, and extension. Violations of the Graduate Honor Code are categorized as follows: *Cheating, Plagiarism, Falsification, and Academic Sabotage* Cheating is defined as the giving or receiving of any unauthorized aid, assistance, or unfair advantage in any form of academic work Plagiarism is a specific form of cheating, and is defined as the copying of the language, structure, idea, and/or thoughts of another and claiming or attempting to imply that it is one's own original work Students who falsify, orally, in writing, or via electronic media, any circumstance relevant to their academic work shall be guilty of a violation of this Code Academic sabotage is purposeful vandalism directed against any academic endeavor or equipment (from the Virginia Tech Graduate Honor System, accessible online at: <http://filebox.vt.edu/studentinfo/gradhonor/>).

Be advised that plagiarism or other forms of violations of the Virginia Tech Honor System will not be tolerated.

Computer requirements:

Course assignments will be completed using the SPSS and STATA software packages. PC versions of these packages are available on all computers in the AA 1 computer lab.

Course Readings

Course text:

	W	(Ch. 2, 3)
	B	Regression Handout 1
February 7		The OLS Regression Model: Estimation
	W	(Ch. 2, 3)
	B	Regression Handout 2
Week 5		
February 12		The OLS Regression Model: Inference
	W	(Ch. 4)
	B	Regression Handout 3
February 14		The OLS Regression Model: Inference
	W	(Ch. 4)
	B	Regression Handout 3
Week 6		
February 19		Heteroscedasticity / Nonscalar Covariance Matrix
	W	(Ch. 8)
February 21		Instrumental Variables Estimation
	W	(Ch. 15)
Week 7		
February 26		TBA
February 28		TBA
Week 8		
March 5		Spring Break (No Class)
March 7		Spring Break (No Class)
Week 9		
March 12		Limited Dependent Variable Models
	W	(Ch. 17)

March 14	Limited Dependent Variable Models
	S
Week 10	
March 19	Limited Dependent Variable Models
	W (Ch. 17)
March 21	Limited Dependent Variable Models
	S
Week 11	
March 26	Panel Data Models
	W (Ch. 13, 14)
March 28	Panel Data Models
	S
Week 12	
April 2	Panel Data Models
	W (Ch. 13, 14)
April 4	Panel Data Models
	S
Week 13	
April 9	Spatial Analysis
	W Dubin (1998)
	W Anselin (2001)
April 11	Spatial Analysis
	S
Week 14	
April 16	APA Conference

April 18	APA Conference
Week 15	
April 23	Spatial Analysis
	Reading TBA
April 25	Spatial Analysis
	S
Week 16	
April 30	Presentation of Final Project
May 2	Presentation of Final Project