

**Data Analytics and Crime (CJUS 4370)**  
**Spring 2022**  
**Location: The Interwebs**

**INSTRUCTOR INFORMATION:**

**Name:** Samuel E DeWitt (you may call me Professor DeWitt or Dr. DeWitt)

**Email:** [samuel.dewitt@uncc.edu](mailto:samuel.dewitt@uncc.edu)

**Office:** Colvard Hall, Room 5084

**Office Hours:** By appointment (virtual only)

**Teaching Assistant:** Nichole Blake

**Email:** [eblake7@uncc.edu](mailto:eblake7@uncc.edu)

**Office Hours:** By appointment (virtual only)

**REQUIRED TEXT:**

**Cunningham, Scott. (2018). Causal Inference: The Mixtape.**

**\*\*** This text is freely available online from: <https://mixtape.scunning.com/index.html>  
(You do NOT have to buy it – just click the chapter links on the left-side menu)

**COURSE OBJECTIVE:**

This course is required to fulfill the Data Analytics concentration for a bachelor's degree in Criminal Justice and Criminology. It also fulfills the upper-level writing-intensive requirement for this same degree. The purpose of this course is to provide a strong foundation for the interpretation and production of causal inference in applied social science research, with special application to the fields of criminology and criminal justice. Broadly, we will explore typical research methods employed to obtain causal inference using experimental, quasi-experimental, and purely observational data. We will cover such topics as multivariate regression, matching and sub-classification, and regression discontinuity. These topics will all be couched within an overarching perspective on the nature of causality – the potential outcomes causal model. My goal is for you to become an informed consumer of applied social science research, with a particular emphasis on a critical evaluation of causal claims. I will assume comfort with basic algebra and that you have an understanding of research methods concepts and basic statistical analysis (measures of central tendency/dispersion, hypothesis testing, bivariate regression and correlation).

**LECTURE DELIVERY**

Lectures are pre-recorded and delivered through Canvas. We will not meet in person nor will there be synchronous Zoom meetings for this class. I narrate all of the lecture slides and I provide additional guided tutorials as necessary (e.g., how to install R & RStudio, how to install RMarkdown, etc...). Links to narrations and tutorials will be provided through Perusall – all course content for a particular topic is organized into thematic topics for the student to completely review by the date indicated on the Perusall assignment page.

## **LEARNING GOALS:**

Students will:

- 1) understand the logic behind the potential outcomes causal framework;
- 2) learn the structure and purpose of causal inference;
- 3) review the fundamentals of applied methods for causal inference in strictly experimental settings;
- 4) learn the proper application of various causal techniques and their suitability for certain types of quasi-experimental or non-experimental research contexts;
- 5) learn to critically evaluate social science research and the causal claims (explicit or implicit) contained therein.

## **COURSE REQUIREMENTS:**

There will be several components to your grade including calculation/programming assignments and exams. The breakdown is as follows:

<b>Grade Components</b>	<b>Worth</b>	
Homework Assignments	20%	A: 89.45-100%
Quizzes	10%	B: 79.45-89.44%
Perusall Participation	15%	C: 69.45-79.44%
Exam 1	20%	D: 59.45-69.44%
Exam 2	20%	F: <59.44%
Exam 3	20%	

**HOMEWORK ASSIGNMENTS:** There will be six homework assignments over the course of the semester. Homework assignments will consist of 4-5 questions that involve material covered in prior lectures. All assignments will require hand calculations or statistical programming in R. Homework assignments will be due by 11:59pm and must be uploaded to Canvas. I will drop the lowest homework grade at the end of the semester. Revisions to homework assignments will not be permitted.

**QUIZZES:** There will be ten short programming/lecture content quizzes administered throughout the semester. Quizzes will be administered through Canvas. The content covered for each quiz will be described on its Canvas page. Once a quiz opens up, you will have 24 hours to complete it. Quizzes will be administered on a roughly weekly basis throughout the semester. I will drop the two lowest quiz grades.

**PERUSALL PARTICIPATION:** Lecture content (readings, slides, narrations) will be grouped into topics on an application called Perusall that I have integrated into Canvas for you (all you have to do to access the site is click on the Perusall link on the lefthand side navigation menu for the course page on Canvas). For each topic, you are required to read the slides and view narrations/tutorial videos in full while also commenting on them, asking questions, or responding to your peers' questions. Perusall allows students to annotate course materials and ask/answer questions as a group (think of it like group note-taking but without having to be in the same room). You will be provided with an individual grade for your own annotations, questions, and reviewing progress for each topic (there are 12 total graded topics). I will drop the three lowest Perusall grades. Further details about this grading process will be provided on Perusall.

**EXAMS:** There will be three exams throughout the semester. Exams will be due by 11:59pm on the day indicated on Canvas. Exams will cover new material from lectures and assigned readings. Exams will consist of several multi-part questions which will require either simple manual calculations or more complicated statistical programming using R. For manual calculations, you must show all of your work – you can accomplish this by using RMarkdown’s native equation language (we will review this in lecture). Exams will be posted approximately two weeks before they are due.

Although exams will not explicitly be cumulative, statistical knowledge is itself cumulative in nature. Therefore, failure to fully understand earlier concepts will make it decidedly more difficult to understand concepts covered later in the semester (read between the lines – review your old exams!).

Students will be afforded the opportunity to revise their first two exams to get back half the credit they initially lost. Exam revisions will be formatted much the same way that the original exam was submitted, but students must correct their incorrect answers and provide an explanation for why their original answers were incorrect (e.g., they used the incorrect function, variables, or incorrectly interpreted a result). Further instructions for the revision process will be uploaded to Canvas.

**Last note:** I know the grade distribution adds up to more than 100% - that’s on purpose to give you some wiggle room. I placed an extra five percentage points on Perusall participation because you have the most control over how well you take notes and, therefore, the most control over how much of those extra points you can get.

### **APPOINTMENTS AND EMAIL ETIQUETTE:**

If you have a question or a problem please contact me through email or Discord (see below for Discord explanation). If you wish to schedule an appointment to meet with me via Zoom, be sure to send me three times you are available to meet and we will find a time that works for both of us.

When you send me an email, put the course name in the subject, be courteous, and sign your name! I will not respond to your email if these conditions are not met. If you send me an email (for any reason), after I reply, send me a reply to confirm you received it, even if it just says “okay” or “thanks.”

I will answer any emails I receive at the end of each workday, typically from 4pm to 5pm during the week (Monday through Friday). I will make my best effort to answer all emails within a 24-hour period, so long as they are received before 5pm on Fridays (in which case, a response will be sent by 5pm the following Monday). All inquiries about grades sent through email will not be answered via email; you must schedule a virtual office appointment to discuss grades. Please note that inquiries about grades may result in an increase to your grade (if your argument is reasonable and I feel you deserve more points than you were awarded) or a decrease to your grade (if your argument is unreasonable and I feel you deserve fewer points than you were awarded).

As an additional resource, I have set up a Discord channel for the class where you can discuss issues you are having with programming/other course content with both myself and your fellow classmates. The link for the Discord Server will be posted to Canvas in an announcement. Please read the instructions within the #welcome channel before you post. Further, since I will not be there to guide you through programming issues in-person, it is of utmost importance that you describe the issues you are having in full detail and, whenever possible, send me a copy of the code and data you are using. Simply stated, saying “I can’t get this function to work” does not provide me with enough context to help you! Please make your email (or Discord post) as detailed as possible and provide code and data files so I can properly diagnose what is going on – it will make the process much easier for both of us.

### **LATE ASSIGNMENT POLICY**

Late assignments will not be accepted with four exceptions. Four times per semester you may request a 72-hour extension to any due date. The 72-hour extension is inclusive of weekends, so an extension requested for an assignment due Friday by 11:59pm will then be due the following Monday by 11:59pm. You need not provide a reason for the request and I will not ask for one. If you would like to use one of these “Life Happens” passes you only need to email me BEFORE the assignment is due and let me know that you will be using one of your passes. You do not need to wait for confirmation that you can use the pass – so long as you have one available (I will track them on Canvas for you), you may assume that I will apply it to the requested assignment (see exclusions in next sentence, though!). These passes may not be used 1) in combination with one another (i.e., only one per assignment), 2) on quizzes, 3) on Perusall participation, or 4) on the final exam.

Exceptions to this practice include university-excused longer-term absences from class or an inability to complete required assignments. In these circumstances, please reach out to me via email and we will put together a reasonable plan for you to complete the required coursework.

### **ACADEMIC INTEGRITY:**

Students are required to have knowledge of and observe all regulations pertaining to campus life and student deportment. The University has enacted two codes of student responsibility: The UNC Charlotte Code of Student Academic Integrity and The UNC Charlotte Code of Student Responsibility. This Code forbids cheating, fabrication or falsification of information, multiple submission of academic work, plagiarism, abuse of academic materials (such as Library books on reserve), and complicity in academic dishonesty (helping others to violate the Code). Any further specific requirements or permission regarding academic integrity in this course will be stated by the instructor and are also binding on the students in this course. For more information, please visit <http://integrity.uncc.edu/>.

Students who violate the Code can be punished to the extent of being permanently expelled from UNC Charlotte and having this fact recorded on their official transcripts. The normal penalty is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases, the course grade is reduced to "F." If you do not have a copy of the

Code, you can obtain one from the Dean of Students Office or access it online at <http://www.legal.uncc.edu/policies/ps-105.html>. Standards of academic integrity will be enforced in this course. Students are expected to report cases of academic dishonesty they become aware of to the course instructor who is responsible for dealing with them. As students willingly accept the benefits of membership in the UNC Charlotte academic community, they acquire obligations to observe and uphold the principles and standards that define the terms of UNC Charlotte community cooperation that make those benefits possible.

\*\*\* Bottom line: Do not cheat. I have failed students for integrity violations before.

## **SEXUAL HARASSMENT**

All students are required to abide by the UNC Charlotte Sexual Harassment Policy (<http://www.legal.uncc.edu/policies/ps-61.html>) and the policy on Responsible Use of University Computing and Electronic Communication Resources (<http://www.legal.uncc.edu/policies/ps-66.html>). Sexual harassment, as defined in the UNC Charlotte Sexual Harassment Policy, is prohibited, even when carried out through computers or other electronic communications systems, including course-based chat rooms or message boards. UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.

UNC Charlotte is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. UNC Charlotte has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and more.

Please be aware that many UNC Charlotte employees, including all faculty members, are considered [Responsible Employees](#) who are required to relay any information or reports of sexual misconduct they receive to the Title IX Coordinator. This means that if you tell me about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, I must [report the information to the Title IX Coordinator](#). Although I have to report the situation, you will still have options about how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

If you wish to speak to someone confidentially, you can contact any of the following on-campus resources, who are not required to report the incident to the Title IX Coordinator: (1) University Counseling Center ([counselingcenter.uncc.edu](http://counselingcenter.uncc.edu), 7-0311); (2) Student Health Center ([studenthealth.uncc.edu](http://studenthealth.uncc.edu), 7-7400); or (3) Center for Wellness Promotion ([wellness.uncc.edu](http://wellness.uncc.edu), 7-7407). Additional information about your options is also available at [titleix.uncc.edu](http://titleix.uncc.edu) under the “Students” tab.

## **RELIGIOUS HOLIDAY OBSERVANCES**

The University of North Carolina at Charlotte is committed to diversity, nondiscrimination and inclusiveness, and to supporting its students, regardless of religious affiliation or non-affiliation, in accordance with state and federal laws and regulations. UNC Charlotte provides reasonable accommodations, including a minimum of two excused absences each academic year, for religious observances required by a student's religious practice or belief. Such reasonable accommodations must be requested in accordance with the procedures in the Policy, and include the opportunity for the student to make up any tests or other work missed due to an excused absence for a religious observance. It is the obligation of students to provide faculty with reasonable notice of the dates of religious observances on which they will be absent by submitting a Request for Religious Accommodation Form to their instructor prior to the census date for enrollment for a given semester. The census date for each semester (typically the tenth day of instruction) can be found in UNC Charlotte's academic calendar.

A student who submits a Request for Religious Accommodation Form after the census date must show good cause for the late submission, and the late submission itself may be taken into account in determining whether the student has a religious practice or belief requiring accommodation and whether granting the request would create undue hardship. If there is no consensus on a reasonable accommodation, either party or both should seek the advice of the department chair. In those cases where a request for a religious accommodation is denied by the instructor, and there is no resolution through discussion with the department chair, the student may pursue a grievance under UNC Charlotte's Student Grievance Procedure. Where a timely request is made by the student but denied by the instructor, the grievance process shall be expedited as much as reasonably possible to ensure that a student pursuing a religious accommodation is not unduly disadvantaged by the passage of time. Failure to comply with this Policy is a violation of University Policy and subject to disciplinary action in accordance with Policy Statement #25, Violation of University Policy.

## **CLASSROOM ETIQUETTE**

*Cell Phones:* Cell phones should be on silent during class, and, more importantly, I do not want to see them (i.e., keep them in your pockets, not on your desk).

If this rule is violated, I will first ask the offending student to put their cell phone away or to make it silent (if it rings during class). If the rule is violated a second time, the student's grade will be reduced by a whole letter grade (an A will become a B).

*Laptops:* Laptops are permitted but only for academic-related purposes. If a student is found to be checking Facebook during class, or simply surfing the internet, I reserve the right to revoke this privilege for the entire class.

***\*\*Online Course Delivery Modification\*\**** - *Use your laptops and phones as much as you want. I am not the boss of you in your own home. Maybe consider using the phone less while watching lectures, though...*

### **WANT THE CLIFF'S NOTES? IN ORDER TO SUCCEED...**

- Come to class as often as humanly possible, on time, ready to listen and contribute.
- Read the material and prepare some insightful comments or questions.
- Respect me, your fellow classmates, and yourself.
- Do not get behind, and do not wait until the last minute to study for exams or to complete assignments.
- Do not be afraid to ask for help if there is something you truly do not understand.

***\*\*Online Course Delivery Modification\*\**** - Be sure to watch lecture videos in their entirety and make sure you email me if you have any questions at all! Also, treat lecture videos like you would treat in-person lectures – set aside a chunk of time to watch them and write notes while watching them. Otherwise, you will not retain the information properly.

### **FINAL NOTE**

This syllabus is meant to be interpreted as a living document. If at any time during the semester I feel the need to change sections of the syllabus to adapt to changing conditions of the classroom, or in the interest of time, I will write a revised version of this syllabus and upload it to Canvas.

## SCHEDULE

Topic	Dates	Subject	Read/Review
1	01/10/22 to 01/16/22	<b>Introduction, Review of Syllabus, RStudio Walkthrough</b>	<i>Syllabus &amp; Review materials on Perusall Chapter 1 (Introduction)</i>
2	01/17/22 to 01/23/22	<b>Introduction to R &amp; RStudio, RStudio Additional Tutorials</b>	<i>Tutorials/Readings on Perusall</i>
3/4	01/24/22 to 01/30/22	<b>RMarkdown Tutorials, Basic Statistics Refresher</b>	<i>Tutorials/Readings on Perusall</i>
4	01/31/22 to 02/06/22	<b>Basic Statistics Refresher</b>	<i>Tutorials/Readings on Perusall</i>
5	02/07/22 to 02/13/22	<b>Review of Probability Theory and Inferential Statistics</b>	<i>Chapter 2 (Probability and Regression Review) Tutorials/Readings on Perusall</i>
5	02/14/22 to 02/20/22	<b>Review of Probability Theory and Inferential Statistics</b>	
6	02/21/22 to 02/27/22	<b>Review of Multivariate Regression</b>	<i>Chapter 2 (Probability and Regression Review) Tutorials/Readings on Perusall</i>
6	02/28/22 to 03/06/22	<b>Review of Multivariate Regression</b>	
8	03/07/22 to 03/13/22	<b>SPRING BREAK</b>	
7/8	03/14/22 to 03/20/22	<b>Theories of Causality; Logic of Matching</b>	<i>Chapter 4 (Potential Outcomes Causal Model) Tutorials/Readings on Perusall</i>
9	03/21/22 to 03/27/22	<b>Propensity Score Matching</b>	<i>Chapter 5 (Matching and Subclassification) Sweeten &amp; Apel (2007) Widdowson et al. (2016) Tutorials/Readings on Perusall</i>
9/10	03/28/22 to 04/03/22	<b>Propensity Score Matching &amp; Tutorial</b>	<i>Tutorials/Readings on Perusall</i>
11	04/04/22 to 04/10/22	<b>Logic of Regression Discontinuity</b>	<i>Chapter 6 (Regression Discontinuity) Tahamont (2019) Thistlewaite &amp; Campbell (1960) Tutorials/Readings on Perusall</i>
	04/11/22 to 04/17/22	<b>MENTAL HEALTH WEEK – No new content</b>	
12	04/18/22 to 04/24/22	<b>Regression Discontinuity Examples</b>	<i>Review Chapter 6 (Regression Discontinuity) Croft &amp; Rees (2013) Yoruk &amp; Yoruk (2011, 2013) Tutorials/Readings on Perusall</i>
13	04/25/22 to 05/01/22	<b>Regression Discontinuity Tutorial</b>	<i>Review Chapter 6 (Regression Discontinuity) Tutorials/Readings on Perusall</i>

\*\*\* The professor reserves the right to alter this schedule as needed. Notification of such changes will be made as early as possible.