Techniques of Data Analysis
CJUS K300
Online, 12 weeks

Contact information:

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Course materials:

Bachman, Ronet, Raymond Paternoster, & Theodore Wilson. *Statistics for Criminology & Criminal Justice (Fifth Edition).* 2021. Sage.

- The textbook is required for this course. Additional materials (e.g., readings; videos; lectures) will be available on the course Canvas website.

Course goals and objectives

- Course bulletin: K300 covers the properties of single variables, the measurement of association between pairs of variables, and statistical inference. Additional topics, such as the analyses of qualitative and aggregated data, address specific criminal justice concerns. (CASE N&M. P: MATH M014 or equivalent. Credit given for only one of K300, ANTH A306, ECON E370 or S370, MATH K300 or K310, POLS Y395, PSY K300 or K310, SOC S371, STAT K310 or S300, or SPEA K300.)
- Thus, in this course, we will cover basic univariate and bivariate *descriptive statistics*, which are used to summarize a given set of data quantitatively, as well as *inferential statistics*, which are used to extrapolate characteristics of a population from sample data. By the end of the course, you should be able to identify, estimate using a statistical program via coding (R/R Studio), and interpret statistical technique(s) that are appropriate for each of a variety of analytical situations.

Technology requirements

- For this class, you will need regular access to a **computer** (not an iPad or other tablet, but an actual computer) on which you have administrative rights to download and install programs. The R and RStudio (aka, Posit) software and related packages we will use in this class are all free and open source, so you will not have to buy any software. You do not need a top-of-the-line computer or any special hardware for this course, but it should be a relatively new PC (Windows 10) or Mac (recent OS) computer. RStudio and R typically look and work the same on a PC and a Mac.
- I do **NOT** recommend the use of a Chromebook for this class. While it is possible to install R/RStudio on some Chromebooks, the process typically requires complicated workarounds. Similarly, it is possible to run R/RStudio on Linux systems with advanced technical knowledge. Another option might be to complete the R/RStudio assignments using Posit Cloud (formerly RStudio Cloud) through your web browser. It might be possible to complete the R assignments for this course with a Posit Cloud Free account or with a relatively inexpensive "Cloud Plus" account.
- If you choose to attempt this course using a Chromebook, Linux, or cloud computing option (i.e., anything other than a useable Windows PC or Mac), then you do so knowing that you are responsible for getting the technology to work by the first week of class, and you do so knowing that I am unable to help you with troubleshooting installation or other technical issues that may arise due to use of non-recommended hardware.
- Finally, the R/RStudio assignments are a required and essential component of this course. Likewise, working technology on which you can use RStudio is a requirement that must be met by the first week of class. Thus, I recommend all students get started ASAP on completing the first R Assignment to ensure that you are able to get R/RStudio working for the remainder of the course.

Course administration and requirements:

- This course is conducted using a series of weekly "modules" containing course lectures, videos, and assignments that will "unlock" (i.e., open or be available) each week on Monday morning.
- Course grade is determined by:
    - Eleven assignments worth 80 points each (880 total)
    - One final exam worth 120 points
- **Assignments: 80pts each (8%); 880pts total (88%)**
    - You will be required to complete eleven assignments to demonstrate knowledge and comprehension of the course materials. Each assignment will cover content from course readings, lectures, and videos.
    - Assignments will be completed online via the course Canvas website. They will "unlock" (i.e., available to complete) each Monday with the weekly module and will be due within one week (i.e., ***assignments due by 11:59pm on Sunday***).
- **Final Exam 120 points total (12%)**
    - The final exam will be cumulative and will require you to demonstrate general knowledge and comprehension of the course materials.
    - The final exam will be taken online via the course Canvas website. The exam will be "unlocked" (i.e., available to take) from 8:00am EST Monday to 11:59pm EST Wednesday on the last week of the course. You will have one hour to take the exam.
    - The exam cannot be paused and will automatically submit *either* one hour after it has started *or* at 11:59pm Wed. (whichever is first) – so be sure to start before 11:00pm Wed.!

Grade scale:

A+ : 97-100%	B+ : 87-89%	C+ : 77-79%	D+ : 67-69%	F: 0-59%
A : 93-96%	B : 83-86%	C : 73-76%	D : 63-66%	
A- : 90-92%	B- : 80-82%	C- : 70-72%	D- : 60-62%	

Academic integrity:

- As a student at IU, you are expected to adhere to the standards and policies detailed in the *Code of Student Rights, Responsibilities, and Conduct* (*Code*). When you submit an assignment with your name on it, you are signifying that the work contained therein is yours, unless otherwise cited or referenced. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged. ***This includes online assignments, discussion board posts, and exams.*** All suspected violations of the *Code* will be reported to the Dean of Students and handled according to University policies. Sanctions for academic misconduct may include a failing grade on the assignment, reduction in your final course grade, and a failing grade in the course, among other possibilities. If you are unsure about the expectations for completing an assignment or taking a test or exam, be sure to seek clarification beforehand.

Note selling:

- ***Distributing the instructor's lectures/notes/study guides is not permitted.*** Violations of this policy will be reported to the Dean of Students as academic misconduct (violation of course rules). Sanctions may include a reduction in your final course grade or a failing grade in the course. Also, distributing or selling a faculty member's notes/study guides individually or on behalf of one of these services using IU email, or via Canvas may also constitute a violation of IU information technology and IU intellectual property policies, which can result in additional consequences.

Students with disabilities:

- Students with disabilities should contact the Disability Services for Students at 812-855-7578 or https://studentaffairs.indiana.edu/disability-services-students/. I must be made aware of any necessary academic accommodations well in advance (at least 2 weeks).

Maintaining a supportive learning environment:

- The role of all employees and students is to create and maintain a supportive and harassment-free working and learning environment for all members of the campus community. I will expect everyone to engage in online discussions from an intellectual standpoint. If at any time you feel threatened or uneasy, please bring it to my attention.

Technical issues:

- Technical and logistical problems, such as being unable to access a computer, computer failure, problems with internet connections (such as speed or quality of the connection) or browser, failure to check that your assignments have properly uploaded, etc., will not automatically result in remedies favorable to students. Even if the technical or logistical problem is not your fault, you are not guaranteed a retake or "do-over" for the assignment. Any such issues are dealt with on a case-by-case basis. Further, to avoid last minute problems, it is highly recommended that you complete readings, videos, and assignments as early as possible during each module.
- If you have a question about the course content including exams, links, or assignments, please contact me at jrbrauer@iu.edu or my graduate assistant Hannah at hrridner@iu.edu.
- If you have a question about navigating or personalizing Canvas as a student, please check here first. If you have a question about difficulty accessing Canvas or other Canvas-related questions, please check the "About Canvas at IU" knowledge base page first. At the bottom of this page, there are instructions for contacting a UITS Support Center consultant.

Course Schedule:

This course schedule is tentative and subject to change. All changes will be announced through email and the course Canvas website. All times refer to Eastern Standard Time (EST).

Chapters listed refer to the required book, *Statistics for Criminology & Criminal Justice (5th Ed.).* Additional required materials (readings, lectures, videos) are posted in weekly Canvas modules. Weekly assignments are posted as "quizzes" on Canvas; these include Canvas-based quiz questions, statistics problems to be completed "by hand," and a corresponding weekly R Assignment to be completed and submitted via Canvas. and for this course are accessible on my website, under course materials, in my version of the course titled Introduction to statistics in R for criminologists.

Week	Date	Topic	Reading/Assignments	
1	5/9 – 5/14	Introduction to Course, Book Website, R/RStudio	Preface; Week 1 Module Assignment 1 R Assignment 1	(Due: 5/14)
2	5/15 – 5/21	Sampling; Key Statistical Terms; Levels of Measurement	Chapter 1; Week 2 Module Assignment 2 R Assignment 2	(Due: 5/21)

Week	Date	Topic	Reading/Assignments
3	5/22 – 5/28	Data Distributions; Simple Data Descriptions; Graphical Presentations	Chapters 2-3; Week 3 Module Assignment 3 (Due: 5/28) R Assignment 3
4	5/29 – 6/4	Measures of Central Tendency	Chapter 4; Week 4 Module Assignment 4 (Due: 6/4) R Assignment 4
5	6/5 – 6/11	Measures of Dispersion	Chapter 5; Week 5 Module Assignment 5 (Due: 6/11) R Assignment 5
6	6/12 – 6/18	Probability Theory; Hypothesis Testing	Chapter 6; Week 6 Module Assignment 6 (Due: 6/18) R Assignment 6
7	6/19 – 6/25	Point Estimation; Confidence Intervals	Chapter 7; Week 7 Module Assignment 7 (Due: 6/25) R Assignment 7
8	6/26 – 7/2	One Population Mean Tests; One Population Proportion Tests	Chapter 8; Week 8 Module Assignment 8 (Due: 7/2) R Assignment 8
9	7/3 – 7/9	Hypothesis Tests with Categorical Data	Chapter 9; Week 9 Module Assignment 9 (Due: 7/9) R Assignment 9
10	7/10 – 7/16	Two Population Hypothesis Tests (Independent Samples; Proportions)	Chapter 10; Week 10 Module Assignment 10 (Due: 7/16) R Assignment 10
11	7/17 – 7/23	Correlation; Ordinary Least Squares Regression	Chapter 12; Week 11 Module Assignment 11 (Due: 7/23) R Assignment 11
12	7/24 – 7/28	Final Examination	Available on Canvas (Due: Wed., 7/26)