Statistics I

SWK 8408

Instructor Info

Dr. Gia Elise Barboza-Salerno

they/them

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Lecture Info

Prereq: None

Friday

1:00pm-3:45pm

Stillman Hall 425V

Lab Info

Fridays

2:45pm-3:455pm

Stillman Hall 425V

Overview of the Course

This introductory course focuses on statistical techniques commonly used in social work and the social sciences. This course will equip students with knowledge of the role of quantitative analyses in social work research and its relationship to other components of the research process. Content in the course will be related to topics studied in students' research methods and theory courses. We focus on acquiring the skills necessary to conduct quality research and learn the basics of presenting information to facilitate informed decision making.

Students will learn how to interpret, conduct and present descriptive and inferential statistical analyses in a data science framework.Students will gain skills to (a) independently manage data files and prepare variables for analysis; (b) match statistical procedures to research questions and hypotheses, and (c) conduct and interpret results of basic statistical procedures. Emphasis will be given to contemporary issues related to social work by exploring the three elementary areas of: (1) description; (2) inference; and (3) correlation as they apply to examples and case studies that emphasize the use of data and statistics to solve real world problems in a social justice framework. The course will focus on the application of skills using SPSS (and Stata if time permits) and on the reporting of findings from analyses.

Basic and common statistical procedures covered will include t-tests, ANOVAs, ANCOVAs, correlations/covariances, and crosstab chi-square tests and non-parametric procedures corresponding to some of these analyses. Students will obtain the skills necessary to conduct power analyses for the procedures covered as well to compute analysis-specific effect sizes. The course will end with a brief introduction to regression analysis.

Note: I reserve the right to make minor modifications to the syllabus. I also incorporate all University and College policies into the syllabus by reference.

Course Textbooks & Other Reading Materials

Required Texts

- An Introduction to Statistical Methods and Data Analysis, 6th Edition. Lyman Ott and Micheal T. Longnecker, Duxbury, 2010; ISBN-13: 978-1305269477. Other editions and online text are permitted. *Note*: This book is available on Canvas.
- Diez, D. M., C. D. Barr, and M. Çetinkaya-Rundel. 2012. OpenIntro Statistics, forth edition. This is an open source textbook and the PDF version is FREE and available here .

Other

Any required journal articles and book chapters will be provided on Canvas.

Recommended Reading

There are many online resources about course content—SPSS and R resources, statistics YouTubes, etc.; several examples are below. Use these resources to answer questions you have while studying assigned readings. They will help you deepen your understanding. It would be good to take a look at each of these sites early on to see what they have and if they will be useful to you.

You can also ask me for supplemental texts or readings that you can borrow.

A good source of lessons and exercises on stats topics covered in this course are listed below. It includes online video lessons and tutorials, etc.

- Big Data for Social Justice - Bootcamp
- Hyperstats Online Textbook
- Trochim's Research Methods Knowledge Base, 2nd Edition. User-friendly lessons on research
- Video lessons on statistics. Khan Academy.
- Information of SPSS's many help functions. Go to the Help menu in the program itself to download the Help resources.

- Lessons and annotated output on many types of analysis, tutorials on SPSS and Stata
- SPSS tutorials
- R tutorials
- Data and variable management and simple analyses in SPSS Kent State University Libraries.
- All issues and error messages in R

Software

1. Open Source Software

- JASP 0.17.3 and R 3.3.0+ will be used to perform some analyses that SPSS does not. JASP is free, open source software available for both Mac, Linux and Windows platforms. To download this software please visit my website and navigate to Day 1 –> Open Source Software.
- R integration for SPSS- a set of extension commands that are implemented in R and available via the SPSS interface. Starting with version 28 these are automatically installed.
- Process is an SPSS macro that runs dozens of mediation, moderation and conditional process models written by Andrew Hayes.
- Follow the instructions on my website to install R integration for SPSS and the PROCESS macro

2. Proprietary Software

- All students must have SPSS installed in their computer. I am using SPSS Version 29, which is the latest available

More information about these software packages will be provided on the first day of class.

FAQs

What is your approach to teaching statistics?

As with all courses, I implement trauma-informed teaching. In a nutshell, that means meeting you where you are at.

Can I do well in this class if I am not good at math?

YES! Statistics is not math. If you can add, subtract, multiply and divide you will do fine.

Why do I need to know statistics?

You need to have a good grasp at statistics so that you can control your narrative, and tell your story.

Why do we have to learn all these different softwares?

Because each of them offers something to make your life much easier. Trust me!

University, College, AND Course Policies

The university maintains policies regarding the conduct of courses and your academic experience at Ohio State. It is your responsibility as a student to review and be aware of these policies. The links to these policies are below:

1. University Policies

- Disability Statement
- Excused Absence Guidelines
- Academic Misconduct
- Grievances and Solving Problems
- Creating an environment free from harassment, discrimination, and sexual misconduct
- Diversity Statement
- Counseling and Consultation Services / Mental health statement
- Content warning language
- Copyright
- Lyft Ride Smart
- Graduate School Handbook

2. College of Social Work Policies

- Attendance Policy
- Incomplete Policy
- COVID-19 Related Safety Expectations for Students in In-Person Classes
- Recommended Technology Support

Learning Objectives

- To make students more comfortable accessing, using and interpreting social work data
- Understand the strengths and limitations of quantitative analyses in social work research
- Understand the role of theory in specifying and testing hypotheses statistically
- Understand the purpose and logic of inferential statistics
- Be familiar with different data structures and their implications for analysis
- Understand the concepts associated with null hypothesis statistical testing (NHST)
- Have skills for managing data files in SPSS/R/JASP, including entering data, merging files, splitting files, etc.
- Have skills for managing variables in SPSS/R/JASP, including naming, labeling attributes, recoding, and computing variables
- Have skills for examining characteristics of variables, including with graphs and tables, in SPSS/R/JASP, including measurement levels, distributions, and missing values, and understand their implications for analysis
- To develop technical skills for describing, analyzing, and presenting quantitative data

Faculty and Student Interaction

This course is designed to facilitate substantive discourse, engagement, and interaction between the instructor and students. The instructor will provide weekly interaction/feedback via Carmen facilitated discussions/assignments, announcements, virtual office hours, scheduled Zoom sessions. Instructor-student interaction occurs at a minimum, weekly and is designed to be initiated by either.

Course Technology Requirements

Technology support: For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at ocio.osu.edu/help/hours, and support for urgent issues is available 24/7.

- Self-Service and Chat support:ocio.osu.edu/help
- Phone:614-688-4357(HELP)
- Email:servicedesk@osu.edu
- TDD:614-688-8743

Technology skills needed for this course

- Basic computer and web-browsing skills
- Navigating Carmen (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)
- Recording a slide presentation with audio narration (go.osu.edu/video-assignment-guide)
- Recording, editing, and uploading video (go.osu.edu/video-assignment-guide)

Required equipment

- Computer: current Mac (MacOs) or PC (Windows 10)
- Other: a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Method of Instruction

The method of instruction for this course is lecture followed by lab work. My experience is that students cannot learn unless the material is being applied. With that said, at times we will work as a flipped classroom and implement a team-based learning approach.

During class time on Fridays (1:00pm-2:45pm), there will be a lecture followed by in class activities and Q&A session. Specifically, students work in teams to complete a practice analysis—assigned each week—to apply and deepen their knowledge of statistics and to get more familiar with using SPSS/R/JASP.

Note: Considering the class size this semester, we would need the whole class period (1:00pm-3:45) for the major analysis project presentations in Week 14 (Dec 3).

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College Attendance Policy

Students in the College of Social Work are expected to attend all classes during their social work studies. Attendance in your courses is an essential part of your social work education and professional development. Any absence deprives you of the opportunity to interact with your instructor and fellow students and interferes with your ability fully acquire the knowledge and skills required for successful social work practice. Although students may occasionally need to miss class due to illness or other important matters, missing more than 25% of the class contact hours in a semester significantly detracts from your ability to master the course content. Instructors often deduct points for absences and if you must miss more than 25% of the class time during a semester you may be required to withdraw from the course and return to your studies when you are able to fully participate in your coursework. Please note that instructors may have additional or more stringent attendance requirements depending on the nature of the course.

Attendance for 8409 (over and above the College Policy)

In a course using team-based learning, full attendance is especially important. Therefore, unique attendance rules apply to the course. As a member of a team, your presence and readiness to engage in class activities is crucial to your team's success as well as your own. Time engaged in classroom team activities is a requirement of the course. Specifically, you will not be able successfully to fulfill course requirements if you miss more than the hours equivalent to 2 class meetings (more than 6 hours). Although it is understood that students may occasionally need to miss class due to illness or emergency, missing more than 2 meetings—regardless of the reason–may require you to withdraw from the course. If an emergency or illness occurs, please notify the instructor. If the instructor receives no communication from the student about the absence and its cause, the student will not be able to make up any in-class assignments. Students who miss a class are responsible for getting all information and materials from the missed class from their teammates.

Accessibility of Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

Religions Accommodations

Our inclusive environment allows for religious expression. Students requesting accommodations based on faith, religious or a spiritual belief system in regard to examinations, other academic requirements or absences, are required to provide the instructor with written notice of specific dates for which the student requests alternative accommodations at the earliest possible date. For more information about religious accommodations at Ohio State, visit odi.osu.edu/religious-accommodations

Class Cancellation

Should in-person classes be canceled, I will notify you as to which alternative methods of teaching will be offered to ensure continuity of instruction for this class. Communication will be via [CarmenCanvas, email or other mode of communication].

Course Expectations

This doctoral seminar presumes that students will adopt an active role in their own and each other's learning processes. Coming to class prepared means coming to class having reviewed and thought about assigned material, and having ideas, questions, and a readiness to work with team members around the content of assigned materials. Students are welcome to work together outside of class to enhance their processing of course content. Although attendance is not explicitly included in the course grading scheme, making well-informed and thoughtful contributions during class discussions and activities is, so attendance and preparation will indirectly be evaluated through class participation. Although the instructor will strive to help students better understand content we work with when they are in attendance and engaged, the instructor is not responsible for re-teaching material missed due to student absences, inattentiveness, or lack of engagement. Students are expected to obtain missed content from their colleagues.

Diversity and Inclusivity Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Course Evaluation by Students

At the end of the semester, students will evaluate the course using the online Student Evaluation of Instruction (SEI) mechanism. Student feedback will also be requested midway through the course and is welcome at any time.

Academic Integrity & Misconduct

The College of Social Work supports fully the University standards on Academic Misconduct. Students are responsible for following University rules detailed in the Student Code of Conduct (3335-23-04 Prohibited conduct) in all academic work. These rules can be found on The Ohio State University website. This includes, but is not limited to: following course rules, no use of unauthorized information or assistance, no plagiarizing, no falsification, no fabrication or dishonesty in reporting research, and no alteration of grades or University forms. Course instructors are strictly bound to report suspected cases of Academic Misconduct.

All student written work will automatically be subjected to TurnItIn analysis through the course Canvas website.

Students are encouraged to study and prepare for class with their team members or other students in the course. However, unless otherwise noted homework assignments are to be completed individually. Working together on individual assignments is considered to be academic misconduct and will be treated as such. Copying work from original sources and failing to appropriately cite the words or ideas of others is academic misconduct. If you have questions about what constitutes plagiarism or other forms of academic misconduct, please don't hesitate to ask the instructor for clarification.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

College Incomplete Policy

"I" (Incomplete) course grades will be considered only in relation to emergency and hardship situations and a request for such a grade option must be discussed

with the instructor prior to the final week of the course. A time for completion of the incomplete work will be established in consultation between the instructor and student; this may not be the maximum time permitted by University policies governing grades of "Incomplete" but will depend on situational circumstances. University policies governing the circumstances under which "I" grades are given and deadlines for completion will be adhered to. Students should note that when an "I" grade with an alternate grade of "E" is assigned in a course which is a prerequisite to a required course which the student must take the next semester, all course requirements for the "I" must be completed before the end of the second week of the next semester.

Class Schedule

Part 1: Building Blocks

Week 1	Class Overview	IntroStat Chapter 1
	Lab	Intro to the Software JASP, R and SPSS
Week 2	Review of Basic Variable Characteristics; Data and Variable Management ; Review of basic concepts	
	Data and Variable Management ; Review of basic concepts	
	Lab	Data and variable management in SPSS
Week 3	Univariate Distributions	IntroStat Chapters 2-3; OpenIntro Chapter 2
	Presentation of Descriptive Statistics	
	Lab	Univariate Descriptives in SPSS
Week 4	Probability Concepts I	Readings: IntroStat Chapter 4; OpenIntro Chapter 3
	Distributions as statistical tools: Normal, t, chi square, and F, distributions	
	Central Limit Theorem	
	Lab	Handling Missing Values
Week 5	Probability Concepts II	Readings: IntroStat Chapter 4; OpenIntro Chapter 3
	From Null Hypothesis Significance Testing to Effect sizes	
	Null Hypothesis Statistics Testing	
	Report of peer-review on the existing study of choice	
	Lab	Organizational Structure of an Academic Paper
Week 6	The Chi Square Distribution and Its Use in Bivariate Analysis	
	The Chi-Square Distribution	Readings: IntroStat Chapter 10
	Lab	Tests of Association and Independence
Week 7	The t Distribution	IntroStat Chapter 4-6; OpenIntro Chapter 7-7.4
	Bivariate Analysis	
	Lab	Bivariate analysis for sample means

Part 2: Intermediate Stats

Week 8	Midterm	Review
Week 9	The F distribution and Its Use in Bivariate or Multi-variate Analysis	IntroStat Chapter 7-8; OpenIntro Chapter 7.5
	Estimation and Comparison of 2 or more means	

	ANOVA & ANCOVA	
	Lab	ANOVA and ANCOVA in SPSS and JASP
Week 10	Correlations as Bivariate Analyses	IntroStat Chapter 11; OpenIntro Chapter 8
	Correlation	
	Bivariate Regression	
	Lab	Correlation in R, SPSS and JASP
Week 11	Knowing Your Dataset and Variables	We will use this day as catch-up too
	Choosing the appropriate Analysis	
	* Individual meeting with course instructor via Zoom or In Person (during class time): Discussion on each student' (1) dataset and variables, (2) analytic plans, and (3) presentation of results in tables and graphs	
Week 12	Non-parametric tests	IntroStat Chapter 6
	Major Analysis Project Presentation	
	Lab	Wilcox's Rank
	Review	Module 2
Week 13	Simple Linear Regression I	IntroStat Chapter 11; OpenIntro Chapter 8
	Lab	Ordinary Least Squares
MODULE 3: Advanced Stats		
Week 14	Multiple Linear & Logistic Regression	IntroStat Chapter 12; OpenIntro Chapter 9
	Lab	Multivariate Regression; Odds ratios
	Multivariate analyses	
	Categorical Dependent Variables	
Week 15	Overview of Stats II	
Week 16	FINAL EXAM	Date & Time & Location

Important Dates

Weekly	Attendance & Participation (10%)	Students are expected to attend all classes (online and in-person) if the situation allows, and actively participate in discussions and class activities.
8/25 (Week1)	Precourse Self-Assessment (2%)	This precourse, open book, self-assessment will evaluate a student's knowledge before the course to determine their proficiency and identify any need for additional review. After reviewing the PhD Program Statistics Review Guide (up to p.27), students are expected to complete the test on Canvas
	Practice Analyses (30%)	Using a provided dataset, each student will prepare a written practice analysis that satisfies the specifications presented in the description for each assignment on the Canvas web pages.
8/08 (Week1)	Practice Analyses (10%)	(1) Data and variable management: This installment will offer opportunities to apply data management skills (e.g., creating and recoding, variable and value labeling, variable inspection) covered in the class.
9/15 (Week4)	Practice Analyses (10%)	(2) Univariate analyses: Students will conduct univariate analyses and use tables/figures to describe the data.
11/17 (Week11)	Practice Analyses (10%)	(3) Bivariate analyses: Students will conduct bivariate analyses (i.e., t-test, Chi-square test, ANOVA, and correlation) and report the findings in publication-quality tables/figures.
10/21 (Week8)	Midterm Quiz (15%)	Midterm will cover up through 10/14
	Peer Reviews (8%)	Students write a critical review of (1) a quantitative article, published in area of interest, and (2) a matched peer's research questions and methods section
9/22 (Week5)	Peer Reviews (4%)	(1) Published article: After selecting one quantitative article of your interest, you will write a 2-page (double-spaced) paper, including (a) a brief summary of research questions, methods (data and sample, measurement, analytic strategy), and findings, and (b) strengths and weaknesses of data/sample, measurement, and statistical methods in addressing research questions as well as tables/figures in presenting the results effectively. Feel free to discuss what you would do differently to improve the article. * Students may be asked to briefly report their reviews during class in Week 5
10/10 (Week11)	Peer Reviews (4%)	(1) (2) Peer's research questions and methods section: Each student will review one matched peer's research questions and methods section and provide constructive feedback and suggestions. * Pay special attention to how your peer's selection of data/sample, measurement, and analytic methods is suitable to address research questions
	Major Analysis Project (35%)	Each student will develop research question(s) and apply statistical knowledge and skills covered during the class (e.g., data and variable management, univariate and bivariate analyses) to address the questions. This project is composed of four mini-assignments: (a) research questions and data selection, (b) a methods section, (c) presentation, and (d) a completed paper

9/29 (Week6)	Major Analysis Project (5%)	(1) Research question(s) and data selection: You will submit up to 3 research questions and explain why these are important questions worthy of your research. In addition, find 1 data set, which is deemed suitable to address your research questions. To qualify, the dataset must contain at least 5 categorical variables (including dichotomous variables) and 5 continuous variables (ordinal, interval, or scale), about which defensible, meaningful research relationships can be formulated
11/3 (Week10)	Major Analysis Project (10%)	(2) A methods section: This paper should be comparable to the Methods section in published research papers. That is, it should include at least the following subsections: data and sample, measurement, and analytic strategy
12/1 (Week12)	Major Analysis Project (5%)	(3) Presentation: You will present the final product to the class (up to 5 min) by using an ePoster template. Submit your presentation slides by the deadline. * Make sure to use the SSWR ePoster template available on Canvas
12/10 (Week13)	Major Analysis Project (15%)	(4) Completed major analysis paper: A completed paper should include (a) a statement of the research aims/goals and research question(s), (b) a brief explanation why these are important questions worthy of your research, (c) a methods section including data and sample, measures, and analytic strategy, (d) a narrative description of the statistical findings (significance and effect size), referencing supporting of the statistical findings, and (e) any limitations. * Make sure to use appropriate tables/figures to present your statistical outputs
Week 14	Final Exam Review Sessions	Review Paper Project Due

** Note: All assignments are due by 11:59pm and will be submitted on Canvas unless otherwise noted.

Grades will follow the standard scale: A = 93-100; A- 90-92; B+ = 97-89; B=83-86; B-=80-82; C+ = 77-79; C=73-76; C-=70-72; D = 60-69.4; F $<$60. Curving is at the discretion of the professor.