PSY K300: Statistical Techniques
Fall 2023 Syllabus

CLASS TIME AND PLACE
Section #10955
Asynchronous Video Lectures MW through Canvas
In-Person Workshops Friday 1:50 PM – 2:40 PM in PY 101

INSTRUCTOR INFORMATION	**TA INFORMATION**
Instructor: Rick Hullinger	TA: Sebahat Gok
Office: PY A300B	Office Hours by appointment
Office Hours will be held via Zoom:	Email Address: sebgok@iu.edu
Monday 10:15 AM – 12:15 PM	
Tuesday 2:00 PM – 4:00 PM	
Or by appointment	
Office Telephone: 812-856-6854	
Email Address: rahullin@iu.edu	

COURSE GOALS
Many students think of K300 as a math course. While it is true that we will perform some calculations along the way, this course is not about the math. I would consider this class a failure if what you learned to do was to plug numbers into arbitrary formulas for unknown reasons to generate more meaningless numbers. Instead, I want you to think about the underlying logic and principles of statistical analysis so that you understand *what the numbers tell you (and what they don't tell you)*, not just how to generate them.

This course will investigate statistics in a hands-on way. We'll explore the theories and concepts in lectures on Monday and Wednesday, and we'll put the concepts into practice in interactive workshops each Friday. This semester you will tackle the process of statistical inference using a variety of different approaches. Along the way you will gain understanding of how statistical inference works and learn how to use appropriate statistical techniques to solve new problems that you encounter after leaving this class. You will become a savvier consumer of the statistical information that bombards you every day and a better researcher should you choose to go in that direction.

This course will include challenging material. However, the tests and assignments are designed so that any student who is willing to put in the time to digest the course content, work hard outside of class, develop and use good study strategies, and contact the me or the TA when they are struggling, can develop a thorough understanding of the material and ultimately succeed in the course.

In this course, successful students will be able to:
- Select and calculate appropriate descriptive statistics and make visual representations of data.
- Demonstrate an understanding of the importance of sampling randomness and measurement noise in statistical inference.
- Understand population parameters and how to estimate them.

- Pick an appropriate statistical technique to test a hypothesis about a particular treatment or experiment.
- Explain and interpret p values with respect to the null and alternative hypotheses.
- Interpret and manipulate basic statistical notations and formulas including summation notation and formulas for both descriptive and inferential statistics. Specific examples will include formulas for the mean, variance, and standard deviation; calculation and interpretation of z scores and understanding of the standard normal distribution; and ability to conduct and interpret the results of t-tests.
- Perform a variety of statistical analyses either by hand or with the appropriate software tools.
- Discuss a set of results including p values, confidence intervals, and effect sizes, with respect to real world relevance and suggested next steps.
- Identify and critique examples of good and bad statistical reasoning in the popular press.
- Identify problems with classical statistical techniques and demonstrate an awareness of alternate methodologies including Bayesian ideas.

STUDENT SUCCESS

I care about the success of *every* student in this class, even if the class size and format prevent me from getting to know each of you individually. When you have questions about the course material, questions about the subject more broadly, concerns to discuss, accommodations you need, or thoughts you want to share, please reach out to me. I am here to help you succeed.

Many students face obstacles to their education because of work or family obligations or unforeseen personal difficulties. If you are experiencing challenges throughout the term that are impacting your ability to succeed in this course, or in your undergraduate career more broadly, please let me know as soon as possible so that we can work together to form a plan for your academic success.

TEXTBOOK & COURSE MATERIALS

We will not be using a textbook for this course. All of the readings, notes, and practice materials that you need will be presented in class and/or provided for you on Canvas.

LECTURE PARTICIPATION

Monday's and Wednesday's lectures will be presented as pre-recorded videos via Canvas. You are expected to watch these videos each week on Monday and Wednesday. Along with the videos, short lecture participation quizzes will be posted on Canvas. The quiz questions will be similar to the questions posed in the videos and all answers will be available in the lecture materials. You must complete these quizzes by 11:59 PM ET (Indiana time) on the day of the lecture and your score on these quizzes will make up your lecture participation score.

Each student will have their three lowest lecture participation scores dropped. Because each student gets three dropped scores, I do not make a distinction between excused and unexcused absences. If you miss lecture due to illness, travel, emergency, or do not complete a lecture participation quiz for any reason, participation for that lecture will be recorded as a zero.

LECTURE FEEDBACK
Along with the lecture participation quizzes, each week a lecture feedback survey will be posted asking you about any topics that were not completely clear to you from the week's materials. Your answers will help me shape our weekly workshop time and structure the course materials as we move forward. These weekly feedback surveys will be due on Wednesday evenings at the same time as the Wednesday Lecture Participation Quizzes. Feedback on 10 or more of the surveys will earn full lecture feedback credit for the course. I appreciate your honest and thoughtful answers.

FRIDAY WORKSHOPS
Friday's class will be held in person in room PY 101. We will use these sessions to work through any confusion from the pre-recorded lectures and to explore software-based techniques for performing statistical analysis. I will use clickers (IU's Top Hat response system) to promote engagement and participation in these workshops, with a handful of clicker questions presented each Friday. To answer these questions, you will be required to set up a Top Hat account. Your responses to the clicker questions will make up your workshop participation credit.

Each student will have their two lowest workshop participation scores dropped. As with the lecture participation, there is no distinction between excused and unexcused absences from the Friday workshops.

Clicker misconduct (e.g., responding for anyone other than yourself, answering any clicker question while not physically in the classroom, etc.) will be considered academic misconduct, and will result in significant grade reductions or failure of K300 as well as other university sanctions.

HOMEWORK
After each Friday workshop, you will have access to a homework assignment that will focus on the concepts and the software that you learned about that week. You must complete each homework assignment and submit your work by 11:59 PM on Wednesday following the workshop. You are free to discuss the content and concepts of the homework with your classmates, but you must do your own work and the answers you submit must be your own. Each student will have their two lowest homework assignments dropped. Late homework will not be accepted.

EXAMS
There will be two sets of exams this semester. The first portion of each exam will be an in-class exam during a Friday class period that will cover your understanding of the conceptual basis of statistics. The in-class exams will be closed-book and closed-note. They will not require computations or the use of any software to analyze data. Following each of these exams, you will be given a take-home exam. The take-home exam will ask you to demonstrate your mastery of the concepts you have learned by analyzing new sets of data using the software and tools we have studied. Like the homework, you are welcome to discuss the take-home exams with your classmates, but you must do your own work and the answers you submit must be your own. Each exam will focus primarily on the new material learned since the previous exam, but questions about older material may be included as well.

There will be a cumulative final exam on Wednesday, Dec. 13th from 12:40 PM – 2:40 PM. Please plan end of semester travel schedules accordingly. The final exam will have the same format and style as the in-class exams.

If you have a scheduling conflict that will interfere with a workshop, turning in a homework assignment, or taking an exam at the scheduled time, you must let me know as soon as possible. Except for extreme and unforeseen circumstances, contacting me the day (or even worse, after) an assignment or exam is due will be considered an unexcused absence and will result in a zero on the late work.

GRADING

Your final grade is computed using the following formula:

Lecture Participation:	10%
Lecture Feedback:	5%
Workshop Participation:	10%
Average of your ten best HW exercises:	25%
Average of your two in-class exams:	20%
Average of your two take-home exams:	20%
Final Exam:	10%
	100%

GRADING SCALE

A+: 97.0%-100%;   A: 93.0%-96.99%;   A-: 90.0%-92.99%
B+: 87.0%-89.99%;   B: 83.0%-86.99%;   B-: 80.0%-82.99%
C+: 77.0%-79.99%;   C: 73.0%-76.99%;   C-: 70.0%-72.99%
D+: 67.0%-69.99%;   D: 63.0%-66.99%;   D-: 60.0%-62.99%
F: Below 60%

RELIGIOUS AND CIVIC OBSERVANCES

Students missing class (lecture, workshop, or exam) or needing an extension for a religious observance can find the officially approved accommodation form by going to the Vice Provost for Faculty and Academic Affairs webpage for religious accommodations. The form must be submitted at least 2 weeks prior to the anticipated absence.

STUDENT RESPONSIBILITY

Grades and feedback on student work are an integral part of the learning process. The primary goal of feedback is to guide you and help you continue learning, not to rank or evaluate you. As such, I expect you to look over your scores and the feedback we provide whenever such feedback is released, and to incorporate that feedback into your future work in the course. It is your responsibility to double-check your assignment and exam grades – both that the work itself was correctly graded and that the scores posted on Canvas match your actual grades. You have two weeks from the time an assignment or exam is returned to the class to address any grading issues. After that, the grades posted on Canvas will be considered final.

EMAIL

I expect you to be checking your IU email account (not just Canvas messages) no less than once a day. I will send frequent messages to the class with announcements, reminders, clarifications, instructions, and/or updates. You are responsible for the content of these messages exactly as if the material had been presented in class. All class-wide messages will be sent using the Canvas Announcement tool, so archived messages can always be found on the Canvas sites.

FEEDBACK

Do not wait until the end of the semester course evaluations to let me know that I could be doing something better. Tell me as soon as possible so that I can make the class valuable and relevant as we go along. If you have any feedback, good or bad, about the course or how it's being taught, please feel free to send it to me *anonymously* using this link.

ACADEMIC HONESTY

This course is conducted under the University's Code of Conduct & Policies. Specifically, it is considered cheating if you obtain any kind of information about answers and solutions to the assignments in this course – exams, quizzes, and homework – from any non-intended source or conversely transfer such information to others. It is also considered misconduct if you lie to me about an absence or extension relating to a homework or an exam or misrepresent your presence in the workshops. The punishment for academic dishonesty will be no less than a zero on the assignment or exam and will likely be **failure of the course**. As per university policy, *all* incidents of academic misconduct must be reported to the Dean of Students office.

GROUPME AND OTHER EXTERNAL MESSAGING PLATFORMS

Please note that you may receive emails from other students about joining GroupMe, Discord, or similar external group messaging platforms for individual classes via Canvas. Even though invitations to join the group may be issued through Canvas, they do not imply the endorsement of the course instructor. While platforms like GroupMe, Discord, etc. can be an effective way of contacting classmates and clarifying information related to the course, they can also be source of unauthorized information sharing or collaboration among students. Collaborative effort on assignments, quizzes, and exams, including sharing or discussing answers when the instructor has not expressly authorized collaboration, is considered cheating. If academic dishonesty occurs via GroupMe or a similar messaging platform, everyone involved in the thread may be found responsible for academic misconduct since membership in the group suggests that that they have been able to view the information shared.

ACCESSIBILITY AND ACCOMMODATION

Every attempt will be made to provide accessibility measures (accommodations) to students with qualifying medical conditions (e.g. mental health, learning, chronic health, physical, hearing, vision, neurological, etc.), under the Americans with Disabilities Act. You must have established your eligibility for support services through Accessible Educational Services for qualifying medical conditions. Note that services are confidential, may take time to put in place, and are forward moving. Captions and alternate media for print materials may take three or more weeks to get produced. Please contact Accessible Educational Services (AES) at 812-855-7578 as soon as possible if accessibility measures are needed. The office is located on the basement floor of Eigenmann Hall, #001.

COUNSELING AND PSYCHOLOGICAL SERVICES

Stressing out over your studies? Just need someone to talk to? IU has trained, professional staff to provide confidential support. Counseling and Psychological Services and Sexual Assault Crisis Services are provided at no charge to all IU students who have paid the student health fee. If you're a first-time client, you can schedule your first, 30-minute CAPS assessment online. All other appointments can be made by calling 812-855-5711. In an emergency you can contact CAPS 24/7 to speak to a crisis counselor. Call 812-855-5711, option 1 or contact your local hospital emergency department. You may also call the 988 Suicide & Crisis Lifeline, a national network of local crisis centers that provides free and confidential emotional support to people in suicidal crisis or emotional distress.

SEXUAL MISCONDUCT AND TITLE IX POLICY

IU policy prohibits sexual misconduct in any form, including sexual harassment, sexual assault, stalking, sexual exploitation, and dating and domestic violence. If you have experienced sexual misconduct, or know someone who has, the University can help. If you are seeking help and would like to speak to someone confidentially, you can make an appointment with the IU Sexual Assault Crisis Services at (812) 855-8900, or contact a Confidential Victim Advocate at (812) 856-2469 or cva@indiana.edu.

University policy requires me to share certain information brought to my attention about potential sexual misconduct with the campus Deputy Sexual Misconduct & Title IX Coordinator or the University Sexual Misconduct & Title IX Coordinator. In that event, those individuals will work to ensure that appropriate measures are taken and resources are made available. Protecting student privacy is of utmost concern, and information will only be shared with those that need to know to ensure the University can respond and assist. I encourage you to visit stopsexualviolence.iu.edu to learn more.

BIAS-BASED INCIDENT REPORTING

Bias-based incident reports can be made by students, faculty, and staff. Any act of discrimination or harassment based on race, ethnicity, religious affiliation, gender, gender identity, sexual orientation or disability can be reported through either of these options:

      1) fill out an online report at https://reportincident.iu.edu/;

      2) call the Dean of Students Office at (812) 855-8187

Reports can be made anonymously at https://reportincident.iu.edu.

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DISCLAIMER

This syllabus is an outline of the course and its policies, which may be changed for reasonable purposes during the semester at the instructor's discretion. You will be notified in class and / or via email if any changes are made to this syllabus, and an updated syllabus will be provided on Canvas.

Statistical Techniques
Fall 2023 Schedule

Week		Date	Description
1	M	Aug 21	Introductions
	W	Aug 23	Levels of Measurement
	F	Aug 25	Workshop 1: Excel Basics
2	M	Aug 28	Histograms
	W	Aug 30	Central Tendency
	F	Sep 01	Workshop 2: Formulas and Central Tendency in Excel
3	M	Sep 04	Labor Day - No Classes
	W	Sep 06	Variability and the Standard Deviation
	F	Sep 08	Workshop 3: Graphs and Histograms in Excel
4	M	Sep 11	The Normal Distribution
	W	Sep 13	Z Scores
	F	Sep 15	Workshop 4: Variability, Plots, and Z Scores in Excel
5	M	Sep 18	Models and Model Evaluation, Part I
	W	Sep 20	Models and Model Evaluation, Part II
	F	Sep 22	Workshop 5: Simulating and Evaluating Models
6	M	Sep 25	The Null Model
	W	Sep 27	p Values
	F	Sep 29	Workshop 6: Calculating p Values
7	M	Oct 02	Consumer Statistics
	W	Oct 04	Exam 1 Review
	F	**Oct 06**	**Exam 1**
8	M	Oct 09	Statistical Significance
	W	Oct 11	Hypothesis Testing with Z Scores
	F	Oct 13	Fall Break - No Classes
9	M	Oct 16	Experimental Designs, Part I
	W	Oct 18	Experimental Designs, Part II
	F	Oct 20	Workshop 7: Between- and Within-Participants Models
10	M	Oct 23	Parametric Statistics: t Tests, Part I
	W	Oct 25	t Tests, Part II
	F	Oct 27	Workshop 8: t Tests in JASP
11	M	Oct 30	Problems with Statistical Significance
	W	Nov 01	Effect Size and Confidence Intervals
	F	Nov 03	Workshop 19: Confidence Intervals and Effect Sizes in JASP
12	M	Nov 06	ANOVAs, Part I
	W	Nov 08	ANOVAs, Part II
	F	Nov 10	Workshop 10: ANOVAS in JASP
13	M	Nov 13	Correlation, Part I
	W	Nov 15	Correlations, Part II
	F	Nov 17	Workshop 11: Correlations in JASP

Week			Date	Description
14	M		Nov 20	Thanksgiving Break - No Classes
	W		Nov 22	
	F		Nov 24	
15	M		Nov 27	Meta-Analysis and Replication
	W		Nov 29	Exam 2 Review
	F		**Dec 01**	**Exam 2**
16	M		Dec 04	Linear Regression
	W		Dec 06	Bayesian Approaches
	F		Dec 08	Workshop 12: Linear Regression in JASP
17	M		Dec 11	
	W		**Dec 13**	**Final Exam, 12:40 -- 2:40 PM**
	F		Dec 15	