Research Method & Statistics Essential I
20249-18:829:522
Fall, 2024

Lecture time: Weds 6:15pm – 8:45pm
Classroom: PSY A230

Instructor: Dr. Cong Liu, Psy.D. Program in Organizational Psychology, Associate Professor, Department of Applied Psychology, Graduate School of Applied and Professional Psychology, Rutgers University, New Brunswick, NY

Email: cl1723@Rutgers.edu Office: 203 Smithers Hall Office Hours: by appt.

Course Description

Students develop skills both in research method, statistical reasoning, and statistical method by actively engaging in the practice of statistics as science. Students will study important current, psychological issues whose understanding requires a fundamental knowledge of research method and statistical concepts.

This class uses a classroom/laboratory approach for analysis of data. According to Cobb (1993, p.4), "the lab approach accords with the movement of statistics back towards its roots in science, and with research in education that demonstrates the importance of active learning."

This class follows the guidelines developed by the American Statistical Association (ASA) and the Mathematical Association of America (MAA) which suggest that teachers should:

- Motivate students by showing them statistics at work in real applications, problems, cases, and projects.
- Use real data and statistical computing (R, JAMOVI, and SPSS).
- Downplay formal training in probability in favor of intuitive concepts of probability.
- Foster active learning in research method and statistics.

Required Readings

- Textbook: Howell, D. C. (2010). *Statistical Methods for Psychology*, 7th Edison. Wadsworth Cengage Learning. ISBN: 978-0-495-59784-1
- Publication Manual of the American Psychological Association. (2021). 7th edition. Washington, D.C., American Psychology Association. ISBN: 9781433842115

Course Requirements

Class and Lab Time: This course contains both a lecture and lab component. Web-based labs will be assigned in each lab meeting to be completed. Both components of the course are essential to your learning of the material. Lab will NOT simply repeat what is covered in lecture. It will extend material presented in lecture and teach you to use R, JAMOVI, and SPSS analysis software that cannot be covered in the lecture meetings.

Evaluation: Your grade will be determined by summing your performance on 10 in-class exercises, 10 lab worksheets, and 3 exams.

- **In-class exercises:** There will be 10 in-class exercises.
- **Lab worksheet:** Every class (except exam days) will include a lab. Included in each lab is a "lab worksheet." At the end of each lab period, you should turn the lab worksheet into your instructor.
- **Exams:** There will be 3 exams. These exams may include both conceptual and computational questions. The format will typically be multiple-choice questions and short answer questions. More information will be given in class.
- **The grading scheme is not a curve:**
    - Each in-class exercise is worth 10 points each (10 X 10 = 100 total)
    - Each lab worksheet is worth 10 points each (10 X 10 = 100 total)
    - Each exam is worth a maximum of 100 point
    - Therefore, there is a total of 500 possible points.

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

The course contract is considered final. The work necessary to obtain the grade you desire has been outlined here. No additional work will be accepted to increase your grade.

Participation: Because this is an active learning class, daily attendance and active participation with your classmates in discussions, problem solving, and computer work is essential if you are to master the key statistical concepts taught in this course. As a result, participation is **NOT** optional – you are expected to attend and participate in every class and lab. Only official university excused absences will be considered and labs must still be completed before the due date to receive credit. Your class grade will be dropped one letter grade for **one** unexplained absence.

Late policy: No make-up in-class exercises, lab worksheets, or exams will be given **unless you have a documented emergency AND you contact me before the exam or assignment is due**. If you have any question about late assignments, please ask me. Do NOT assume an assignment can automatically be turned in late.

- **Lab worksheets:** Lab worksheets cannot be submitted late or early unless you clear it with me. If you have to miss a lab, you need to submit the lab worksheet before the due date. Only emergency situations will be considered for make-up labs.
- **Exams:** If you are going to miss an exam, you need to let me know 48 hours before the exam (unless emergency situations). Otherwise, make-up exam is not allowed.

If You Need Help...

Please visit me during my office hours with any questions you have. My job is to help you learn. If you need help, get it early; don't wait until you are "so lost I don't know what to ask." Please, make an appointment with me, talk to me after class, or e-mail me at: cl1723@rutgers.edu.

Course Schedule

Week	Date	Lecture	Reading	Due in Class	Class Format
WK1	9.4	Lecture 1: Introduction & R, JAMOVI, and SPSS		Lab 1	In-person
WK2	9.11	Lecture 2: Describing and exploring data	Ch 2. Describing and Exploring Data	Lab 2	On-line
WK3	9.18	Lecture 3: Normal dist. & sampling dist.	Ch 3. The Normal Distribution Ch 4. Sampling Dist. and Hyp. Testing	Lab 3	In-person
WK4	9.25	Lecture 4: One-sample z-test	Ch 7. Hypothesis Tests Applied to Means	Lab 4	On-line
WK5	10.2	**Exam I**	Review sheet I Formula sheet I		In-person
WK6	10.9	Lecture 5: One-sample t-test & Review	Ch 7. Hypothesis Tests Applied to Means	Lab 5	On-line
WK7	10.16	Lecture 6: Related-sample t-test & independent-sample t-test	Ch 7. Hyp. Tests Applied to Means Ch 8. Power	Lab 6	In-person
WK8	10.23	Lecture 7: Review & ANOVA	Ch 11. Simple Analysis of Variance	Lab 7	On-line
WK9	10.30	Lecture 8: Two-Way ANOVA & Chi-square test	Ch 6. Categorical Data and Chi-Square	Lab 8	In-person
WK10	11.6	**Exam II**	Review sheet II Formula sheet II		On-line
WK11	11.13	Lecture 9: Correlation	Ch 9. Correlation and Regression	Lab 9	In-person
WK12	11.20	Lecture 10: Regression	Ch 9. Correlation and Regression	Lab 10	On-line
WK13	11.27	No Class (Friday Classes)			
WK14	12.4	Lecture 11. Factor Analysis	Chapter 13. Factorial Analysis of Variance		In-person
WK15	12.11	All Assignments Are Due Prepare for the Final Exam	Hold data for make-up class, if necessary		
WK16	12.18	**Exam III**	Review sheet III Formula Sheet III		On-line

Attendance: It is expected that each student attends every scheduled class. If you are unable to attend a class due to illness or will be late, please email me prior to class. Students are excused from class when observing religious holidays, in accordance with Rutgers University policy, however the instructor must be informed of the absence. An excused absence can also occur if the student is ill, and/or the student has been told to quarantine, and/or are experiencing symptoms of any transmittable disease. Please note as per University Policy students must register/report their absence from class Self Reporting Absence System https://sims.rutgers.edu/ssra/ and students may be asked to verify their absences https://studentsupport.rutgers.edu/services/absence-and-verification-notices. Students will be responsible for all material covered during their absence.

Computer use in class: Students are not to use computers for purposes other than note-taking or class-related activities. Students may be asked to leave class if they are identified as using computers for non-class activities.

Academic Integrity: All Rutgers students should review and adhere to the University principles of academic integrity, available at:
https://academicintegrity.rutgers.edu/sites/default/files/pdfs/current.pdf

Statement on Disabilities: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/getting-registered

Names and Pronouns: Class rosters list students by their legal names, but I am more than happy to address you by your preferred name and gender pronouns. Please let me know your preferences early in the semester so I can update my records accordingly.

Respect for Diversity: My goal is to ensure that students from all backgrounds and perspectives are well-supported in this course, both in and out of the classroom. I aim to address the diverse learning needs of each student and to recognize the diversity you bring as a valuable resource, strength, and benefit. I am committed to presenting materials and activities that respect and celebrate diversity in all its forms, including gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. Your feedback and suggestions are always welcome and appreciated.