

## **Research Design and Inference I (PSYC520)**

### **Fall 2024**

**Lecture:** Wednesday 5:00 – 6:20 p.m. @ Alumni Hall 0302

**Lab:** Wednesday 6:30 – 7:50 p.m. @ Alumni Hall 1201

**Instructor:** Mitsuru Shimizu

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**Office Hours:** Wednesday 4:00 – 4:50 p.m. or by appointment

**T.A.:** Parker Kent

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**Office Hours:** Wednesday 10:00 a.m. – 12:00 p.m. or by appointment

#### **Required Textbook:**

Howell, D. C. (2017). *Fundamental Statistics for the Behavioral Sciences*, 9<sup>th</sup> ed. ISBN: 978-1-305-65297-2

#### **Required Statistical Software:**

SPSS is available on lab computers and can be downloaded from

<https://www.siue.edu/its/labsclassrooms/vlab/spss.shtml>

JAMOVI (Ver. 2.2.5) is available on lab computers and can be downloaded from

<https://www.jamovi.org/download.html>

#### **Useful Websites:**

Purdue APA style Online Writing Lab: <https://owl.english.purdue.edu/owl/section/2/10/>

APA Style Blog: <http://blog.apastyle.org/>

**General Teaching Philosophy:** Psychology constitutes theory and practice, with both elements built upon a strong empirical philosophy. Empirical scientific methodology and statistical analysis are the tools used by psychology as a science. However, interpreting scientific methodology and statistical analysis is equally important for psychology as a practice. No matter what type of psychology you will pursue, the understanding of this empirical basis will be of great use, as it is the core that lies at the heart of our discipline. The main purpose of this course (PSYC520) is to provide an introduction to non-experimental research methodologies and inferential statistics for them. The intent of this sequence of courses is to teach you this empirical philosophy and to give you the tools you need in order to explore human behavior. What this sequence is not intended to do is to force you to do all of the statistical procedures we will cover by hand, nor make you memorize a large amount of complex formulas. Instead, I wish to focus on teaching theory and understanding of science and inferential statistics. Armed with this, you should be able to tackle most problems and quickly learn those that are new to you.

## Course Objectives:

1. Learn the strengths and weaknesses of different non-experimental research designs.
2. Learn how to choose the appropriate inferential statistics to analyze your data.
3. Become proficient in the use of SPSS for the computer aided calculation of descriptive and inferential statistics.
4. Learn how to interpret and draw conclusions from the results of your analyses.
5. Learn how to communicate your results in APA format results sections.
6. Develop the ability to critique non-experimental research findings reported by others.

**Lecture:** The first 80-minute session will be a series of lectures. The readings will complement the lecture materials. However, some things will be covered in lecture that will not be covered in the book. You are responsible for learning everything that is covered in class, including group activities. The lecture notes will be posted, but they are only an approximation of what will be covered in class. **The best strategy is to print out the notes before class, bring them to class, and then write additional notes on top of them.**

**Lab:** The second 80-minute session will be lab based, covering use of computer based statistical tools (SPSS) and how to write up the results of your analyses. However, please note that lectures may bleed over into Lab sections from time to time. Attendance is required at both sessions, as lectures usually end with a quiz and labs usually end with an activity. Most standard techniques will be taught in SPSS, supplementing with JAMOVI when useful or necessary. We will do limited hand calculations, focused on teaching concepts rather than computations. **Importantly, you will be asked to participate in twelve individual/group activities in lab sessions (see schedule).**

**Evaluation:** You will be graded on the basis of your:

- a) Quizzes (12%). You will be asked to complete a quiz consisting of four multiple choice questions after the lecture session each week (see schedule; total of 12 quizzes are planned). These quizzes serve to focus you on the concepts we are covering each week. These quizzes are open book/note, but must be taken independently.
- b) Activities (28%): You will be asked to participate in twelve activities (see schedule; total of 12 activities are planned). During lab, you can collaborate with other students to solve questions, but you need to submit your answers individually. Most of them will focus on demonstrating that you can run the statistical procedures taught in lab independently, understand the results, and explain them to us. You will be expected to use APA format to present data and results. Typically, your answers will be accompanied with the SPSS output.
- c) Exams (60%). The midterm exam will constitute 25% of your final grade and the final cumulative exam will constitute 35% of your final grade (see schedule). All questions will be multiple-choice format. These exams are NOT open book/open note. Unless you can document that you experienced illnesses or crises during the exams, there will be no make-up exams.

**Grades:** I will use the following scale to assign letter grades:

90 and above = A

80-89 = B

70-79 = C

60-69 = D

59 and below = F

**DEPARTMENT OF PSYCHOLOGY POLICY ON INCOMPLETE GRADES AND WITHDRAWAL:** All withdrawals must be completed by the end of the 13th week of classes during fall and spring, and by a similarly late date (i.e., before 82% of class meetings have occurred) in any summer term. Grades that apply to students who initiate a withdrawal and grades that apply when a student fails to officially withdraw within established deadlines are determined by university policy (see <http://www.siu.edu/policies/1j1.shtml>). The granting of a grade of I (Incomplete) is not automatic. It is available only in cases when a student has completed most of the work required for a class but is prevented by a medical or similar emergency from completing a small portion of the coursework before the deadline for grade submission. An I must be approved by the instructor with appropriate documentation provided by the student. If an instructor agrees to give a student an I, the instructor will fill out a Memorandum of Incomplete Grade to be kept with the student's records. If the work is not completed by the time specified on the Memorandum, the student's grade will be changed from I to F.

**Statement on Disabilities:** SIUE offers a range of resources to support students with disabilities. At SIUE every effort has been made to eliminate barriers to learning and help you reach your educational goals. If you are a student with a disability and wish to request accommodations, please contact Disability Support Services located in Rendleman Hall, Room 1218 (phone: 650-3726).

**SIUE Statement on Diversity:** All societies and peoples have contributed to the rich mix of contemporary humanity. In order to achieve domestic and international peace, social justice, and the development of full human potential, we must build on this diversity. SIUE nurtures an open, harmonious, and hospitable climate that facilitates learning and work. Each member of the University is responsible for contributing to such a campus environment.

**SIUE Nondiscrimination policy:** Southern Illinois University Edwardsville (SIUE) is a public comprehensive University committed to creating and maintaining a diverse community in which students, faculty, and staff can learn and work together in an environment free of discrimination and free from any form of illegal harassment. Such actions violate the dignity of the individual and the integrity of the University as an institution of learning. SIUE prohibits discrimination against employees, applicants for employment and students on the basis of age, color, disability, marital status, national origin, race, religion, sex, sexual orientation, or veteran's status. Discrimination in any form will not be tolerated; management and supervisory personnel, at all levels, are responsible for taking reasonable and necessary action to prevent discrimination.

**Academic Integrity:** Students are reminded that the expectations and academic standards outlined in the Student Academic Code (3C2) apply to all courses, field experiences and educational experiences at the University, regardless of modality or location. The full text of the policy can be found here: <https://www.siu.edu/policies/3c2.shtml>.

**Recordings of Class Content:** Faculty recordings of lectures and/or other course materials are meant to facilitate student learning and to help facilitate a student catching up who has missed class due to illness or quarantine. As such, students are reminded that the recording, as well as replicating or sharing of any course content and/or course materials without the express permission of the instructor of record, is not permitted, and may be considered a violation of the University's Student Conduct Code (3C1), linked here: <https://www.siu.edu/policies/3c1.shtml>.

**Expected Schedule (Subject to Change)**

Week	Date	Topic	Reading	Notes
1	8/21	Syllabus		
2	8/28	Philosophy of Science. Overview of Research Methods	Ch. 1 & 2	Quiz1/Activity1
3	9/4	Observation & Measurements, and Non-Parametric Tests	Ch. 19	Quiz2/Activity2
4	9/11	Descriptive Stats and Visualizing Data	Ch. 3, 4, & 5	Quiz3/Activity3
5	9/18	Non-Experimental Research Methods and Hypothesis Testing	Ch. 6, 7, & 8	Quiz4/Activity4
6	9/25	Factor Analysis		Quiz5/Activity5
7	10/2	Reliability		Quiz6/Activity6
8	10/9	<b>Midterm Exam</b>		
9	10/16	Covariation, Correlation, & Regression	Ch. 9 & 10	Quiz7/Activity7
10	10/23	Statistical Control and Partial Correlation		Quiz8/Activity8
11	10/30	Multiple Regression/Mediation	Ch. 11	Quiz9/Activity9
12	11/6	Moderation Part 1		Quiz10/Activity10
13	11/13	Moderation Part 2		Quiz11/Activity11
14	11/20	Logistic Regression		Quiz12/Activity12
15	11/27	<i>Thanksgiving Break</i>		
16	12/4	Flex Time/Review		
17	12/11	<b>Final Exam</b>		

**Notes: Activities are due by 2 p.m. on the following Mondays. I am not accepting late assignments or email attachments.**