

# PSYX 222: PSYCHOLOGICAL STATISTICS

University of Montana  
Fall 2019 (CRN 72490)

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## COURSE INFORMATION

### LECTURE

- *Location:* JRH 202
- *Day:* Monday, Wednesday, Friday
- *Time:* 10:00-10:50am
- *Website:* [Moodle](https://moodle.umt.edu) (https://moodle.umt.edu)

### LAB

- *Location:* FA 210
- *Day:* Thursday
- *Times:* 10-10:50am (section 01); 11-11:50am (section 02); 3-3:50pm (section 03); or 4-4:50pm (section 04)

## INSTRUCTORS

### PROF. RACHEL SEVERSON, PH.D.

- *Email:* [rachel.severson@umontana.edu](mailto:rachel.severson@umontana.edu)
- *Office:* Skaggs 371
- *Office hours:* Mon. & Wed. 1-2:30pm, and by appointment

### LAB INSTRUCTOR: LINUS CHAN

- *Email:* [yinloklinus.chan@umontana.edu](mailto:yinloklinus.chan@umontana.edu)
  - *Office:* Skaggs 368
  - *Office hours:* Tues. & Fri. 1-3pm, and by appointment
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## WHAT IS THIS COURSE ABOUT?

This 3-credit course introduces students to statistics commonly used in Psychological Science. *This course assumes no prior knowledge of statistics.*

We will examine the fundamentals of statistical techniques, including basic descriptive and inferential statistics, with a focus on the underlying statistical concepts. You will gain the ability to identify appropriate statistical procedures for many basic research situations and to compute the necessary calculations.

Lectures will be complemented by laboratory exercises that focus on the same general themes, with an emphasis on hands-on statistical analyses using statistical software.

## WHAT ARE THE PREREQUISITES?

PSYX 100S (Introduction to Psychology); PSYX 120 (Research Methods); M 115 (Probability & Linear Math), M 162 (Applied Calculus), or M 171 (Calculus 1); or instructor permission.

## WHAT ARE WE TRYING TO ACHIEVE?

By the end of this course, you should be able to:

- Conceptually understand and apply basic statistical procedures.
- Calculate basic descriptive and inferential statistics (by hand & using SPSS).
- Apply elements of the research methods and design of a scientific study.
- Understand and apply ethical procedures in psychological research.
- Understand how to collect and analyze scientific data.

## MATERIALS: WHAT DO YOU NEED?

### REQUIRED TEXT

Aron, Coups, & Aron (2013). *Statistics for psychology* (6<sup>th</sup> Ed.). Boston: Pearson.

- Textbook is on reserve in Mansfield Library

### REQUIRED LAB MATERIALS

Free articles and datasets accessible from [Open Stat Lab](http://www.openstatslab.com) (www.openstatslab.com)

### REQUIRED EQUIPMENT

Calculator (that can add, subtract, multiply, divide, square root – *but not a mobile phone*).

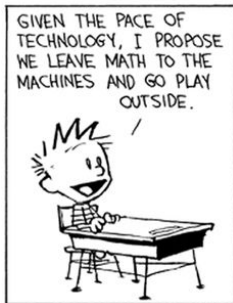
**ASSESSMENT OF LEARNING: HOW WILL WE KNOW IF WE HAVE MET OUR GOALS?**

Activity	% of Grade	Date
<b>Exams</b>	<b>64%*</b>	
Midterm Exam 1	16%	Friday, 9/20
Midterm Exam 2	16%	Friday, 10/11
Midterm Exam 3	16%	Monday, 11/4
Midterm Exam 4	16%	Wednesday, 12/4
Final Exam	16%	Thursday, 12/12 (8:00-10:00am)
<b>Practice Problems</b>	<b>16%</b>	Due at start of class (see Lecture Schedule)
<b>Lab</b>	<b>20%</b>	See Lab Schedule
<b>Total</b>	<b>100%</b>	

**EXAMS (64%)**

The exams will focus on the material presented in lectures and the textbook. Exams 1-4 will only cover material since the previous exam (except to the extent that the previous material is necessary for understanding the new material). The final exam is cumulative. You may use a calculator and you may also bring a one-page single-sided “cheat sheet” to the exams (which you’ll submit with your exam).

*\*The exams count toward your grade as follows:*



Your lowest midterm exam score (out of 4) will be dropped (including a grade of 0 for a missed exam). The remaining three midterm exams are each worth 16%. The final exam is worth 16% of your grade and cannot be dropped.

**PRACTICE PROBLEMS (16%)**

*Statistics is a skill* – it is necessary to DO statistics, not just read and understand. Following each lecture, complete **ALL** of the assigned practice problems (Set I). You can check your answers with the answers provided at the back of the text. Each *complete* assignment (i.e., all assigned problems attempted) is worth 10 points.

**About Practice Problems:**

- **Due at the START of the next lecture.** They will be considered late after 5 minutes.

- **Must include ALL assigned problems** to receive 10 points (i.e., no partial credit). Incomplete practice problems receive 0 points. If you’re unsure how to complete a problem, make a note indicating the part you’re unclear about on your assignment.
- They should be **neatly hand written** with all pages **stapled** together (not paper clipped or corner-folded).
- **Show your work** when the problem involves a formula. At minimum, show each complete formula in its basic form with all numbers filled in, at least one intermediate step, and the final answer.
- For written (non-formula) problems, your answer should **NOT** use exact wording provided in the answers at the back of the text.
- **Late practice problems lose 5 points** for that assignment, and **must be submitted before the exam** following the due date for that assignment to receive the partial credit. You are allowed, over the entire semester, a total of **four late practice problems without penalty** (i.e., no point deduction), provided they are submitted by the start of the next exam following due date for those practice problems.

**LABS (20%)**

The lab component of the course includes an introduction to statistical software (SPSS) and practicing calculating statistics by hand. In addition, you will receive credit for attending the labs.

## WHAT IF I MISS AN EXAM OR SUBMIT AN ASSIGNMENT LATE?

### MAKE-UP EXAMS

The exam dates in this syllabus are non-negotiable. If you have a conflict with one or more of the exam dates due to personal commitments, you should consider taking the class a different semester. A make-up exam may be offered **ONLY** for VERIFIABLE REASONS:

- Medical or family *emergency* (verified by medical professional or Dean of Students)
- Participation in University-sponsored activities (verified in advance)
- Military service or mandatory public service

Other reasons for a missed exam – family holiday, friend/relative wedding, etc. – are NOT approved excuses. *An exam missed for reasons other than the university-approved reasons will result in an exam grade of zero.* All decisions regarding make-up exams are at the discretion of the professor. Exams will be returned and the answers reviewed in class a few days after each exam (except Exam #4). Once the answers have been reviewed in class, all students who have not yet taken that exam (even for an approved reason) receive a zero on it.

Therefore, you should contact me as soon as possible – preferably **BEFORE** the exam – if you will miss an exam due to the above university-approved reasons.

### LATE PRACTICE PROBLEMS

I strongly discourage late assignments. Because the course material is largely cumulative, students who turn in assignments late are more likely to struggle to learn subsequent material. My late assignment policy is as follows:

- (1) You are allowed, over the entire semester, a total of **four late assignments without penalty**, so long as they are received before the exam following the assignment due date. ***You do not need to provide any reason for turning assignments in late***, whether you were sick, had another obligation that day, or overslept.
- (2) For each additional late assignment, you will **lose 5 points** (out of a possible 10 points) on that assignment.
- (3) **All practice problems** due up to that point (and since the last exam) **must be turned in before the exam following the assignment due date** or you will lose credit for that assignment.

## A FINAL NOTE ON ETHICAL CONDUCT

*Don't Cheat. Don't Plagiarize. It's Not Worth It.*

**ACADEMIC MISCONDUCT** is taken seriously and is unacceptable. Please review the UM [Student Conduct Code](http://www.umt.edu/vpsa/policies/student_conduct.php) ([http://www.umt.edu/vpsa/policies/student\\_conduct.php](http://www.umt.edu/vpsa/policies/student_conduct.php)). “The Student Conduct Code at the University of Montana embodies and promotes honesty, integrity, accountability, rights, and responsibilities associated with constructive citizenship in our academic community.” **This code and procedures apply to this course.** All work for this class must reflect your own work. As specified in the Student Conduct Code, academic misconduct includes, but is not limited to:

- *Plagiarism*: representing someone else’s work (words, ideas, data, materials) as your own.
- *Misconduct during an examination or academic exercise*: Copying from another student’s paper/exam, giving information to another student, consulting unauthorized materials.
- *Submitting false information*: Knowingly submitting false, altered, or invented information, data, quotations, citations, or documentation in connection with an academic exercise.

**THE CONSEQUENCES** are more severe than you may think...

Academic misconduct will result in a zero for that exam or assignment and the incident will be reported to the Dean of Students and the Dean of the College of Humanities and Sciences to be dealt with in accordance with UM Student Conduct Code. *It is your responsibility to know the Student Conduct Code.*

## COURSE FORMAT: HOW IS THE COURSE ORGANIZED?

### LECTURE

The lectures will provide you with basic information about statistical analyses in psychology. Lecture will include working on calculations together. The most effective learning generally occurs in an interactive environment, so please speak up at any point if something is unclear or if you have a comment relevant to the topic at hand. The lecture schedule on the last page is subject to change. Changes will be announced in class and posted on Moodle. If there is a discrepancy between the printed schedule and the schedule on Moodle, we will follow the schedule on Moodle.

### LABS

The lab sections have their own independent content and instructor, which is complementary to the lectures. The lab schedule and activities are listed on the last page of the syllabus. The labs are **not** simply review sessions for material presented in lectures. Therefore, if you miss labs, you will miss important information that may not be covered in lectures. The Lab Instructor is available for consultation outside of labs, particularly during office hours.

### MOODLE

Announcements, lecture outlines, assignments, and grades will be posted on the course Moodle site. Lecture outlines will be posted before class, so that you can print and take notes on them (if you want to). You are expected to print and bring assignments and handouts to lecture/lab.

### STUDENT RESPONSIBILITIES

Please come to every class – lecture and lab – prepared to participate. *If you miss a lecture* you are responsible for obtaining missed notes and important announcements from another student. You are responsible for all material contained in the handouts, all assigned readings, and for completion of all assignments by the due date. If you are having trouble mastering the course content, be sure to take advantage of our office hours each week. We are here to help you learn.

### ACADEMIC ACCOMMODATION

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students \(umt.edu/dss\)](http://umt.edu/dss). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406-243-2243. I will work with you and Disability Services to provide an appropriate modification.

### FINAL EXAM HARDSHIP

Students may seek relief from writing more than two final examinations during the same day. Students scheduled for more than two final examinations on one day may contact the instructor to request/arrange for an alternate testing time during the final examination week. If satisfactory arrangements cannot be made, the student should seek the assistance of his or her dean.

### NO SPECIAL DISPENSATION

The scheduled assignments/exams and the grading system in this course apply to all students equally. *Sometimes a student will ask for special dispensation (e.g., changing a due date or test date) or an additional opportunity to earn more points (e.g. re-take a test or do other extra credit assignments). My answer will always be “No” because I do not make concessions or provide opportunities for some students that are not also provided to all other students in the course.*

### GRADING SCALE

Final grades are based on the following scale:

Grade	Percent	Grade	Percent
A	93-100%	C	73-76.9%
A-	90-92.9%	C-	70-72.9%
B+	87-89.9%	D+	67-69.9%
B	83-86.9%	D	63-66.9%
B-	80-82.9%	D-	60-62.9%
C+	77-79.9%	F	59.9% & less

**LECTURE SCHEDULE**

	Date	Topic	Reading	Practice Problems (Set I) (Due by start of next class)
<b>Section 1: The Basics</b>	M 8/26	Introduction & Course Overview	Syllabus	
	W 8/28	Some Basics & Frequency Tables	Ch 1: 1-10	Ch 1: 1, 2, 4a, 5a
	F 8/30	Describing a Distribution Graphically	Ch 1: 10-24	Ch 1: 4bc, 5bde, 7, 10
	M 9/2	<b>NO CLASS – Labor Day</b>		
	W 9/4	Measures of Central Tendency	Ch 2: 34-43	Ch 2: 1ab, 2ab, 5a
	F 9/6	Measures of Variability	Ch 2: 44-58	Ch 2: 1cde, 2cde, 5bc, 8
	M 9/9	Z-Scores	Ch 3: 68-73	Ch 3: 1, 2, 3
	W 9/11	Normal Curve I	Ch 3: 74-81	Ch 3: 4, 5
	F 9/13	Normal Curve II & Sample and Population	Ch 3: 81-89	Ch 3: 6, 7
	M 9/16	Probability	Ch 3: 89-99	Ch 3: 10, 12
	W 9/18	Exam Review		
	F 9/20	<b>Midterm Exam 1 (Ch. 1, 2, 3)</b>		
<b>Section 2: Fundamentals of Hypothesis Testing</b>	M 9/23	Basic Logic & Steps of Hypothesis Testing	Ch 4: 108-119	Ch 4: 1ab, 2
	W 9/25	One- and Two-tailed Tests	Ch 4: 120-125	Ch 4: 1c, 3, 4
	F 9/27	Distribution of Means I	Ch 5: 139-148	Ch 4: 5, 6
	M 9/30	Distribution of Means II	Ch 5: 139-148	Ch 5: 1, 2, 3
	W 10/2	Z Test I	Ch 5: 148-158	Ch 5: 6ab
	F 10/4	Z Test II	Ch 5: 148-158	Ch 5: 8abc
	M 10/7	Decision Errors & Effect Size	Ch 6: 177-186, 210-212	Ch 6: 1, 2, 3
	W 10/9	Exam Review		
	F 10/11	<b>Midterm Exam 2 (Ch. 4, 5, 6)</b>		
<b>Section 3: The <i>t</i> Tests</b>	M 10/14	The <i>t</i> Tests: Intro & One-sample <i>t</i> Test I	Ch 7: 226-240	
	W 10/16	One-sample <i>t</i> Test II	Ch 7: 226-240	Ch 7: 1, 2
	F 10/18	Dependent Means <i>t</i> Test: Difference scores & hypothesis testing I	Ch 7: 240-245	Ch 7: 4, 5
	M 10/21	Dependent Means <i>t</i> Test: hypothesis testing II	Ch 7: 245-252	Ch 7: 7
	W 10/23	Independent Means <i>t</i> Test: Logic & <i>t</i> -score	Ch 8: 275-282	Ch 8: 1, 2
	F 10/25	Independent Means <i>t</i> Test: Hypothesis testing I	Ch 8: 283-286	Ch 8: 3, 4
	M 10/28	Independent Means <i>t</i> Test: Hypothesis testing II	Ch 8: 286-294	Ch 8: 5, 7b
	W 10/30	Review & Comparison of <i>t</i> Tests	Ch 8: 296-297	Ch. 7: 3ab, 6; Ch. 8: 6ab
	F 11/1	Exam Review		
M 11/4	<b>Midterm Exam 3 (Ch. 7, 8)</b>			
<b>Section 4: ANOVA &amp; Correlation</b>	W 11/6	One-Way ANOVA: Logic	Ch 9: 316-324	
	F 11/8	One-Way ANOVA: Hypothesis testing I	Ch 9: 325-338	Ch 9: 1a, 2ab
	M 11/11	<b>NO CLASS - Veteran's Day</b>		
	W 11/13	One-Way ANOVA: Hypothesis testing II	Ch 9: 325-338	Ch 9: 3abd
	F 11/15	One-Way ANOVA: Planned contrasts	Ch 9: 340-342	Ch 9: 5abef, 6ab
	M 11/18	One-Way ANOVA: Post-hoc comparisons + Effect Size	Ch 9: 343-346	Ch 9: 7 + calculate effect size ( $R^2$ ) for 7ac
	W 11/20	Scatter Diagrams and Patterns of Association Intro to logic of Correlation Coefficient ( <i>r</i> )	Ch 11: 439-454	Ch 11: 1, 2ab, 3ab
	F 11/22	Calculating <i>r</i> & Significance of Correlation Coefficient	Ch 11: 454-461	Ch 11: 2cde, 3cd
	M 11/25	Correlation Coefficient: Interpretation	Ch 11: 458-468	Ch 11: 2f, 3f, 6ab
	W 11/27	<b>NO CLASS - Thanksgiving</b>		
	F 11/29	<b>NO CLASS - Thanksgiving</b>		
	M 12/2	Exam Review		
W 12/4	<b>Midterm Exam 4 (Ch. 9, 11)</b>			
F 12/6	Final Exam Review			
R 12/12	<b>Final Exam (8:00-10:00am)</b>			

**LAB SCHEDULE**

Wk	Date	Topic	In-Lab Assignments
1	R 8/29	Lab Introduction & Overview Review Research Methods	
2	R 9/5	SPSS: Introduction, Measures of Central Tendency & Variability	SPSS Output: Central Tendency & Variability
3	R 9/12	Review: Looking Up & Calculating Z-Scores	Worksheet: Z-scores
4	R 9/19	Exam 1 Review	
5	R 9/26	OSL: Introduction	SPSS Output: New variables and descriptive statistics
6	R 10/3	Review: Z Test	Worksheet: Z-test
7	R 10/10	Exam 2 Review	
8	R 10/17	OSL: One Sample <i>t</i> -test	SPSS Output: One Sample <i>t</i> -test
9	R 10/24	OSL: Dependent Means <i>t</i> -test	SPSS Output: Dependent Means <i>t</i> -test
10	R 10/31	OSL: Independent Means <i>t</i> -test	SPSS Output: Independent Means <i>t</i> -test
11	R 11/7	OSL: Pre-Registration	Worksheet: Pre-Registration
12	R 11/14	OSL: One-way ANOVA (+ Planned Contrasts and Post-Hoc Comparisons)	SPSS Output: One-way ANOVA
13	R 11/21	OSL: Correlation	SPSS Output: Correlation
14	R 11/28	<b>NO LAB – Thanksgiving</b>	
15	R 12/5	<b>NO LAB</b>	

**LAB ACTIVITIES & ASSIGNMENTS**

	Points	% of Grade
<i>SPSS Output: Central Tendency &amp; Variability</i>	2	2%
<i>Worksheet: Z-scores</i>	2	2%
<i>SPSS Output: New variables and descriptive statistics</i>	2	2%
<i>Worksheet: Z-test</i>	2	2%
<i>SPSS Output: One-sample <i>t</i>-test</i>	2	2%
<i>SPSS Output: Dependent Means <i>t</i>-test</i>	2	2%
<i>SPSS Output: Independent Means <i>t</i>-test</i>	2	2%
<i>Worksheet: Pre-Registration</i>	2	2%
<i>SPSS Output: ANOVA</i>	2	2%
<i>SPSS Output: Correlation</i>	2	2%
<b>Total</b>		<b>20% of final grade</b>

**LAB ATTENDANCE**

It is expected that students will attend their lab sections. An absence may be excused by the Lab Instructor *prior* to the scheduled lab section, and lab assignments must be submitted by an agreed-upon date in order to receive credit.

**MISSING OR LATE LAB ASSIGNMENTS**

All Lab assignments are due by 11:55pm of the due date listed above and must be submitted on Moodle > Lab (except where noted above). Note that although most assignments will be completed during your Lab Section, some assignments will be completed outside of Lab Section. Late assignments lose 0.5 points for each 24-hours late (including weekends) (e.g., after 4 days late you receive 0 points on that assignment).