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PSYX 222.00: Psychological Statistics

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PSYX 222: PSYCHOLOGICAL STATISTICS

University of Montana
Spring 2018 (CRN 34833)

COURSE INFORMATION

LECTURE

- *Day:* Monday, Wednesday, Friday
- *Time:* 11:00-11:50am
- *Location:* CHEM 123
- *Website:* [Moodle](https://moodle.umt.edu) (<https://moodle.umt.edu>)

LAB

- *Day:* Thursday

INSTRUCTORS

PROF. RACHEL SEVERSON, PH.D.

- *Email:* rachel.severson@umontana.edu
- *Office:* Skaggs 371
- *Office hours:* Mon. & Fri. 12:30-1:30pm, and by appointment

• *Times & Locations:*

- 10-10:50am (section 01) DAH 306
- 11-11:50am (section 02) FA 210
- 3-3:50pm (section 03) FA 210
- 4-4:50pm (section 04) FA 210

LAB INSTRUCTOR: SUSAN GREENE

- *Email:* susan.greene@umontana.edu
- *Office:* Skaggs 004
- *Office hours:* Tues. 9:30-11:30am, and by appointment

WHAT IS THIS COURSE ABOUT?

This 3-credit course provides an introduction 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 concepts of the statistics. You will gain the ability to identify appropriate statistical procedure for many basic research situations and to carry out the necessary calculations.

Lectures will be complemented by laboratory exercises that focus on the same general themes, with an emphasis on hands-on data collection and 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:

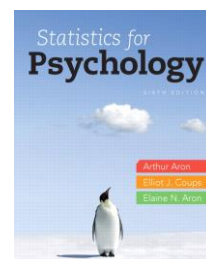
- Conceptually understand and apply basic statistical procedures.
- Calculate basic descriptive and inferential statistics (by hand & using SPSS).
- Apply elements of the research methods and design of a scientific study.
- Understand and apply ethical procedures in psychological research.
- Understand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

MATERIALS: WHAT DO YOU NEED?

REQUIRED TEXT

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

Course Reserves: Textbook is on reserve in Mansfield Library.



REQUIRED EQUIPMENT

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

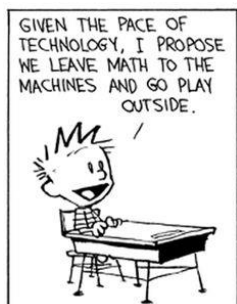
ASSESSMENT OF LEARNING: HOW WILL WE KNOW IF WE HAVE MET OUR GOALS?

Activity	% of Grade	Date
Exams	64%*	
<i>Midterm Exam 1</i>	<i>16%</i>	<i>Wed., Feb. 14</i>
<i>Midterm Exam 2</i>	<i>16%</i>	<i>Mon., Mar. 12</i>
<i>Midterm Exam 3</i>	<i>16%</i>	<i>Fri., Apr. 6</i>
<i>Midterm Exam 4</i>	<i>16%</i>	<i>Wed. May 2</i>
<i>Final Exam</i>	<i>16%</i>	<i>Thurs., May 10 (10:10am-12:10pm)</i>
Practice Problems	16%	Start of lecture (see Lecture Schedule)
Lab	20%	See lab schedule for details
Total	100%	

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) is worth 10 points.

About Practice Problems:

- **Due at the START of each lecture** on the date listed on the schedule. They will be considered late after 5 minutes.
- **Must include ALL assigned problems** to receive credit (i.e., no partial credit). 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 for the **first** four late practice problems), provided they are submitted by the start of the next exam following due date for those practice problems. See next page for more details.

LABS (20%)

The lab component of the course includes an introduction to statistical software (SPSS) and practicing calculating statistics by hand. You will

also conduct a Lab Study in which you will collect and analyze data. 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 UNIVERSITY-APPROVED REASONS:

- Medical emergency (verified by a medical professional)
- Family emergency (verified by the Dean of Students Office)
- 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***. Specifically, you can turn in for full credit (10 points) your first four late assignments, so long as they are received before the exam following the assignment due date.

(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). “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.

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 at Start of Class on...
Section 1: The Basics	M 1/22	Introduction & Course Overview	Syllabus	
	W 1/24	Some Basics & Frequency Tables	Ch 1: 1-10	
	F 1/26	Describing a Distribution Graphically	Ch 1: 10-24	Ch 1: 1, 2, 4a, 5ac
	M 1/29	Measures of Central Tendency	Ch 2: 34-43	Ch 1: 4bc, 5bde, 7, 10
	W 1/31	Measures of Variability	Ch 2: 44-58	Ch 2: 1ab, 2ab, 5a
	F 2/2	Z-Scores	Ch 3: 68-73	Ch 2: 1cde, 2cde, 5bc, 8
	M 2/5	Normal Curve I	Ch 3: 74-81	Ch 3: 1, 2, 3
	W 2/7	Normal Curve II & Sample and Population	Ch 3: 81-89	Ch 3: 4, 5
	F 2/9	Probability	Ch 3: 89-99	Ch 3: 6, 7
	M 2/12	Exam Review		Ch 3: 10, 12
	W 2/14	Midterm Exam 1 (Ch. 1, 2, 3)		
	F 2/16	NO CLASS		
Section 2: Fundamentals of Hypothesis Testing	M 2/19	Presidents' Day – NO CLASS		
	W 2/21	Basic Logic & Steps of Hypothesis Testing	Ch 4: 108-119	
	F 2/23	One- and Two-tailed Tests	Ch 4: 120-125	Ch 4: 1ab, 2, 3abc, 4a, 5a, 6
	M 2/26	Distribution of Means – Activity		Ch 4: 1c, 3d, 4bc, 5bc, 7
	W 2/28	Distribution of Means	Ch 5: 139-148	
	F 3/2	Z Test I	Ch 5: 148-158	Ch 5: 1, 2, 3
	M 3/5	Z Test II	Ch 5: 148-158	Ch 5: 6ab
	W 3/7	Decision Errors & Effect Size	Ch 6: 177-186, 210-212	Ch 5: 8abc
	F 3/9	Exam Review		Ch 6: 1, 2, 3
	M 3/12	Midterm Exam 2 (Ch. 4, 5, 6)		
Section 3: The <i>t</i> Tests	W 3/14	The <i>t</i> Tests: Intro & One-sample <i>t</i> Test	Ch 7: 226-240	
	F 3/16	Dependent Means <i>t</i> Test: difference scores & hypothesis testing	Ch 7: 240-245	Ch 7: 1, 2,
	M 3/19	Dependent Means <i>t</i> Test: hypothesis testing	Ch 7: 245-252	Ch 7: 4, 5
	W 3/21	Independent Means <i>t</i> Test: Logic & <i>t</i> -score	Ch 8: 275-282	Ch 7: 7
	F 3/23	Independent Means <i>t</i> Test: Hypothesis testing	Ch 8: 283-294	Ch 8: 1, 2
	March 26-30 Spring Break – NO CLASS			
	M 4/2	Review & Comparison of <i>t</i> Tests	Ch 8: 296-297	Ch 8: 3, 4, 7a
	W 4/4	Exam Review		Ch. 7: 3ab, 6; Ch. 8: 5ab
	F 4/6	Midterm Exam 3 (Ch. 7, 8)		
Section 4: ANOVA, Correlation, & Prediction	M 4/9	One-Way ANOVA: Logic & calculate <i>F</i> -ratio	Ch 9: 316-331	
	W 4/11	One-Way ANOVA: Hypothesis testing	Ch 9: 333-338	Ch 9: 1a, 2ab
	F 4/13	One-Way ANOVA: Planned contrasts & Post-hoc comparisons	Ch 9: 340-344	Ch 9: 3abd
	M 4/16	Scatter Diagram & Patterns of Association	Ch 11: 439-449	Ch 9: 6, 7
	W 4/18	Correlation Coefficient: Logic & calculate <i>r</i>	Ch 11: 451-457	Ch 11: 1, 2ab, 3ab, 4ab
	F 4/20	Correlation Coefficient: Hypothesis testing	Ch 11: 458-461	Ch 11: 2c, 3c, 4c
	M 4/23	Correlation Coefficient: Interpretation	Ch 11: 462-468	Ch 11: 2de, 3d, 4d
	W 4/25	Prediction I	Ch 12: 493-507	Ch 11: 2f, 3f, 6
	F 4/27	Prediction II	Ch 12: 508-514	Ch 12: 1a-e, 2a-e, 3
	M 4/30	Exam Review		Ch 12: 4a-i, 9
	W 5/2	Midterm Exam 4 (Ch. 9, 11, 12)		
	F 5/4	Final Exam Review		
	R 5/10	Final Exam (10:10am-12:10pm)		

LAB SCHEDULE

Wk	Date	Topic	Assignments
1	R 1/25	Lab Introduction Research Ethics Certification Review Research Methods	Assignment: Research Ethics Certification (http://ori.dhhs.gov/education/products/montana_round1/research_ethics.html) Complete sections 1, 2, & 6 (Due 2/22)
2	R 2/1	SPSS: Introduction, Measures of Central Tendency & Variability	DUE: SPSS Output
3	R 2/8	Review: Z-Scores & Normal Curve	
4	R 2/15	No Lab	
5	R 2/22	Introduction to Lab Study	DUE: Research Ethics Certification (Sections 1, 2, 6)
6	R 3/1	No Lab: complete Lab Study data collection	
7	R 3/8	Review: Z Test & Decision Errors	
8	R 3/15	SPSS: Lab Study Data Entry	DUE: Lab Study Data (SPSS file and data sheets)
9	R 3/22	SPSS: <i>t</i> -tests	DUE: SPSS Output
10	R 4/5	Review: <i>t</i> -tests	
11	R 4/12	SPSS: One-way ANOVA	DUE: SPSS Output
12	R 4/19	SPSS: Correlation	DUE: SPSS Output
13	R 4/26	Review: ANOVA & Correlation	

LAB ACTIVITIES & ASSIGNMENTS

	Points	% of Grade	Due Date
<i>Lab Attendance</i>	2 each lab	6%	Throughout semester
<i>SPSS Output: Intro to SPSS & Central Tendency & Variability</i>	2	2%	2/1
<i>Research Ethics Certification</i>	2	2%	2/22
<i>Lab Study: Data Sheets (hand in at end of lab)</i>	2	2%	3/15
<i>Lab Study: SPSS data file</i>	2	2%	3/15
<i>SPSS Output: t-test</i>	2	2%	3/22
<i>SPSS Output: ANOVA</i>	2	2%	4/12
<i>SPSS Output: Correlation</i>	2	2%	4/19
Total	20% of final grade		

LAB ATTENDANCE

Lab attendance will be taken and credit will be granted as follows: Present (2 points), Excused Absence (1 point), Absent (0 points). An absence may be excused by the Lab Instructor prior to the scheduled lab section.

MISSING OR LATE LAB ASSIGNMENTS

All assignments are due by 11:55pm of the due date listed above and will be submitted on Moodle > Lab (except where noted above). Note that most assignments will be completed during your Lab Section. However, some assignments will be completed outside of Lab Section. Late assignments lose ½ point for each 24-hours late (including weekends) (e.g., after 4 days late you receive 0 points on that assignment).