Psychology 302: STATISTICAL METHODS
302 Gerlinger, MW 14:00-15:20 (2-3:20 pm)
Labs: Mondays 4-5:20, Tuesdays 12-1:20, 2-3:20, 180 Straub Hall

Instructor: Bridget Klest, M.A.
Office: 353 Straub
E-mail: bklest@uoregon.edu, **Phone:** 346-4966 with voice mail **Office Hours:** W 10-12
Teaching Assistants: Mark Reid, mreid1@uoregon.edu, 407 Straub, 346-5778, office hours TBA
Annmaire Cholankeril, acholank@uoregon.edu, 202 Straub, 346-4881, office hours TBA

Text: Gravetter, F. J., & Wallnau, L. B. (2005). Essentials of statistics for the behavioral sciences. Belmont, CA: Thomson/Wadsworth.
Course web page: Blackboard

Course Description

This course will introduce you to descriptive and inferential statistics, teach you how to calculate statistics and analyze data using a computer statistics package, and improve your ability to understand and evaluate the statistical information reported in primary research articles.

This class both is and is not really a math class. While you will be learning how to do statistical calculations by hand, this course is very different from courses taught in mathematics departments. The focus in this class is on **conceptual understanding** of statistics. In the past, most students have found that the actual "number crunching" in this class is relatively easy. It is the conceptual understanding of statistical methods that is more difficult. Once you understand the concepts, you will probably have little trouble doing calculations. **Tests will be focused on conceptual understanding, while homeworks will apply concepts to actual problems**. Please keep this in mind as you approach this course.

Requirements

1. Participation credit is gained from in-class exercises, which you will turn in during class. Credit is based not at all on whether you got the right answer, but only on whether you tried. If you attend every class and do the exercises, you will get full credit. In-class exercises will not occur on a fixed schedule and will not be part of every class, so the only way to ensure full credit is to attend every class.

2. Homework assignments are listed at the end of this syllabus, and will be due **in class** each week on Wednesday, beginning week 2. You may drop your lowest homework score and replace it with your highest homework score. If you miss a homework you will receive a 0 and that will count as your lowest score. **No late homeworks will be accepted for credit**. However, even if you fail to get a problem set in on time, you are required to turn in all homework assignments **by the last class session** in order to get 5% of the course grade. This 5% of the course grade is awarded on an all or none basis. If you turn in all your assignments (even if they are turned in late) you get the 5%, if you are missing even just one, you don't get any of the credit.

3. Quizzes/Exams will take place on 5 Wednesdays throughout the term. The quizzes will consist of multiple choice questions, **and will be primarily conceptual**. This means that **quizzes and homeworks will cover different material**. All quizzes will *focus* on material presented since the previous quiz, but will require knowledge from throughout the course (because all of the material in the course is cumulative, the quizzes will also be cumulative). The quizzes are closed book, and you will not be required to do calculations on the quizzes. At the end of the term, you will have the option of taking a "make-up" quiz, which will replace the lowest of your 5 quiz scores. Therefore, if you miss a quiz (and have a score of 0 for that quiz) the makeup quiz can be used to replace that. **This is the only option for making up missed quizzes, no exceptions!**

What Do Students Need to Do to Succeed in This Class?

1. **Read the assigned material**. That includes following the numeric examples closely and writing down questions about anything not entirely clear. *You <u>are</u> expected to read the text*, in full.
2. **Complete the homework assignments (and turn them in on time).** Nearly all students who fail this course fail primarily because they either do not complete their homework assignments, or do not complete them on time. I do not know of a single student who has failed who has also turned in all completed homework assignments on time.
3. **Attend the class sessions.** If you must miss a class, it is *your* responsibility to come to my office hours, or your TA's office hours, and find out what you've missed. Missing class, for whatever reason, does not entitle you to any special treatment or relaxed deadlines. *Do not fall behind!*
4. **Attend your lab section.** Lab sections are not optional. In order to complete the homework problems, you will need to learn how to use the computer program SPSS, which will only be covered in lab. If you know you will have to miss a lab, let your TA know and try to attend a different lab section.
5. **Ask questions.** This is an *introduction* to statistical methods in psychology. You are not expected to know anything about this topic yet. Therefore, no question is a "dumb" question. If you don't understand something, speak up! This is the only way I will know when I am not explaining something clearly. You can ask questions in class, by e-mail, and in office hours.
6. **Study for quizzes.** The quizzes will focus on your conceptual understanding of course material covered in lecture, labs, and readings. The best way to study for quizzes is to attend all classes/labs, complete all assignments, do all your reading, and ask questions when you don't understand something. **Quizzes will cover different material from what is on HWs!**

Grading

Your *final course grade* is based on the following components:

45% Score on the 9 homework assignments, each worth 5%

45% Score on 5 quizzes/exams, each worth 9%.

5% For turning in *all* homework assignments. These are "all or none" points, received if you turn in all assignments, not received if you do not. They are an added incentive for completing all homeworks. *Note: you can receive these points even if some assignments are handed in late, as long as all assignments are handed in by the last day of class..*

5% Participation in in-class exercises

Final grades will be based on percentage of total possible points earned, and distributed as follows:

A+	*Reserved for exceptional performance*		
A	93-100	D+	67-69.9
A-	90-92.9	D	63-66.9
B+	87-89.9	D-	60-62.9
B	83-86.9		
B-	80-82.9	N*	less than 70
C+	77-79.9	P*	70 or higher
C	73-76.9		
C-	70-72.9		

**If taking Pass/Fail*

Rules and Policies

No late homeworks will be accepted. No makeup quizzes will be given, other than the one final make-up quiz at the end of the term. It is your responsibility to stay on top of things, plan ahead, and leave some wiggle room in case an unexpected emergency comes up. You have the option of dropping **one** homework score and replacing **one** quiz score with the makeup quiz. **No exceptions will be made to this policy.** If unexpected circumstances come up that cause you to miss more than one homework assignment and more than one quiz, it is suggested that you talk to me to determine whether you should withdraw from the course and re-take it another term.

Collaborative learning is encouraged: If you want to discuss the problems with other students, feel free to do so. Talking over the problems and reworking them when you discover that others got different answers promotes deeper understanding of concepts and gives you more practice in applying skills. However, **each student must submit separate homework**, and you must show your work (**no photocopies or word-for-word copying**). This is also the case for SPSS problems—you may work together to get the SPSS output, but then each person must interpret and annotate the output individually.

The TAs and the instructor take academic integrity seriously. **Cheating** is defined as providing or accepting information on a quiz or exam, plagiarism or copying anyone's written work, or allowing someone else to copy your work. In addition, lying to try to get points (e.g., lying about having turned in an assignment on time) is considered acamic dishonesty and will be treated as cheating. Students caught cheating will be given an "**F**" for the course, and UO's student conduct coordinator will be informed. The instructor retains the right to assign seats for tests, to change an individual's seating for test security purposes, to require and check ID for admission to tests.

A note on A+ grades: A+ grades are reserved for performance that **stands out** from the rest of the class. If everyone in the class earned 90% or above, everyone in the class could get an A grade. However, if everyone in the class earned grades of 98% or above, no one could receive an A+ grade, as the A+ grade is reserved for **outstanding** or **exceptional performance**, and will be given to a *maximum* of 1-2 students in a class this size. For your own sanity—please do not "go for" an A+; it is not worth it. Also, recently most graduate schools have adopted a policy of requiring applicants to recalculate their GPA's without A+ grades included, meaning A+ grades usually carry the same weight as good old regular A grades.

SPECIAL NEEDS

Students with Disabilities: If you have a documented disability and may need accommodations, contact me ASAP. Please let me know in advance even if you are not sure that your disability will require accommodation (for example, if you have a physicial disability that may require you to miss class, but you aren't sure it will). With advance planning, adjustments can be made. Last minute changes are problematic.

Student Athletes: You must let me know during the first week of classes if you will miss class due to travel with a UO athletic team and require accommodation. Requirements for the course will not be relaxed for student athletes, however minor scheduling accommodations may be made (e.g., taking a quiz a few hours early) if planned well ahead of time.

Other Students: If you are repeating this class, or if you are a student with children, a job, or have other circumstances that might affect your ability to devote time to the class, please let me know now so we can discuss strategies to promote your success in this course. If you wait until you have problems in the course it may be too late to salvage your grade, but planning ahead will likely lead to success.

CLASS SCHEDULE

Note: This is an outline for the course, subject to change at any time. Updates to this schedule will be discussed in class, so please attend. Being unaware of a change due to missing class is not an excuse for being unprepared.

Date	Topic	Readings	Quizzes/Assignments
4/2	Course Introduction		
4/4	Scaling, Frequency Tables, Histograms	Ch. 1-2	
4/9	Central Tendency and Variability	Ch. 3-4	
4/11	Z-Scores and the Normal Distribution	Ch. 5	HW 1 Due, **Quiz 1**
4/16	Probability and the Normal Distribution	Ch. 6	
4/18	The Distribution of Sample Means	Ch. 7	HW 2 Due
4/23	Hypothesis Testing with z	Ch. 8-9	
4/25	Introdution to the t-test	Ch. 10	HW 3 Due, **Quiz 2**
4/30	More about t: Independent vs. Related	Ch. 11	
5/2	Finish t, intro to Analysis of Variance	Ch. 13	HW 4 Due
5/7	More on ANOVA		
5/9	Intro to Advanced ANOVA	Ch. 14	HW 5 Due, **Quiz 3**
5/14	More Advanced ANOVA		
5/16	ANOVA Review		HW 6 Due
5/21	Correlation	Ch. 15	
5/23	Regression		HW 7 Due, **Quiz 4**
5/28	Chi-Square	Ch. 16	
5/30	More Chi-Square		HW 8 Due
6/4	Which Test?, Review and Recap		
6/6	Quiz 5, make-up quiz		HW 9 Due, **Quiz 5, Makeup Quiz** *Last day to turn in late HWs*

HOMEWORK ASSIGNMENTS

**Put your name and your TA's name on all homework.*

Problems are at the end of each chapter. **Turn homework in on time!** To earn full credit, *show and explain all work.* For problems completed by hand, show all steps. **Annotate** SPSS output to receive full credit: Circle the most important numbers and explain (write or type directly and legibly on the output) what they mean. You must demonstrate that you are able to read and understand what you have produced. In addition, for any problem that includes hypothesis testing, you must include all steps of hypothesis testing including an APA style summary of your results. The book has answers to odd-numbered problems in the back. Use these for extra practice or to check your work.

Homework 1: Concepts, Scaling, Frequency Tables and Histograms (15 pts)

Ch 1 (p. 27): problems 5, 8, 12 & 19; Ch 2, problem 8. You may do problem 8 either using SPSS or by hand. Label your axes! If you use SPSS for problem 8, be sure to include the output, clearly identify which parts of the output go with the homework question, and don't forget part c of the question.

Points: Problems 5, 8,12: 2 pts each; problem 19, 4 pts, Ch. 2 problem 8, 5 pts.

Homework 2: Central Tendency & Variability (15 pts)

Ch 3, problems 8 & 10. Ch 4, problem #14 (by hand, using the computational formula) & Ch. 4, #16. You will do #16 a total of three times. Do it **first** by hand, showing all steps and using definitional formula (step 1) and then **again** using SPSS (use SPSS to find the mean, sample variance, and standard deviation for the data - step 2). NOTE: SPSS will automatically treat the data as a *sample,* not a population, this is okay. Finally, do it **again** using SPSS, but change the numbers around until you have a data set with the SAME mean and n, but twice the sample variance as the original data set (use trial and error method, and the definition of variance to help you!). Include output from SPSS showing the mean, variance, & sd for original and altered data sets, annotate to clarify which parts of the printout go with steps 2 & 3, and include the numbers in the altered data set you created for step 3.

Points: Ch 3, 8&10, 2 pts, Ch 4, #14, 4 pts; #16 (by hand, SPSS, extra step): 7 pts.

Homework 3: z-Scores & the Normal Curve (15 pts)

Ch 5, problems 2, 6, 14, 22. ***For question 22, be sure to explain your answer.*** Ch 6, problems 8ab, 10ac, 13cd. No SPSS homework this week.

Points: Problem 6 worth 3 pts; Other problems worth 2 pts each.

Homework 4: Distribution of Sample Means, z-test & t-test (15 pts)

Ch 7, problems 13 & 26. Ch 8, problems 6 & 8. Ch 9, problem 6. Be sure to show all work and explain answers fully. Include APA-style summaries of your results for ch. 8 problem 8. In ch. 9 problem 6, the phrases "3-point effect" and "6-point effect" are redundant and do not have any special hidden meaning—they just mean a difference in means of 3 or 6 points, like the numbers in the problem show. No SPSS homework this week.

Points: Chapter 8 problem 8 worth 5 pts., ch 9 problem 6 worth 4 pts. Other problems worth 2 pts each.

Homework 5: t-Tests with Independent Samples and Related Samples (15 pts)

Ch 10, problems 8ab & 22a. Ch 11, problems 4 & 22. Do Ch 10 problem 22a & Ch 11 problem 22 *both by hand and on SPSS*. On the "by hand" versions, state the research question, follow step-by-step hypothesis-testing method, and end with answer to research question, using an APA-style summary of your results. Annotate printout by circling the key elements in the output and explaining what the output shows.

Points: Ch 10 #8 & Ch 11 #4, 2 pts each. Ch 10 #22 & Ch 11 # 22, 5.5 pts each.

Homework 6: ANOVA (15 pts)

Ch 13, problems 4, 18 & 24. Do the ANOVA for Ch. 13 problem #24 *both by hand and using SPSS* (note: treat the birth variable as a fixed effect). For by hand version, state research question, follow and show all calculations and hypothesis testing steps, and also create an ANOVA summary table. In SPSS version, do both Scheffé and Tukey post-hoc tests. Annotate output, including explaining results (what did you find?). Include and APA-style summary of your results.

Points: Problem #4, 2 pts, #18, 4 pts; #24, 9 pts.

Homework 7: Advanced ANOVA (15 pts)

Ch 14, problems 18, 20c (by hand) & 24 (SPSS). Do #24 ANOVA using SPSS (not by hand). Request a plot for help in interpreting the interaction. Annotate output, including an explanation of your results. Be sure to include all hypothesis-testing steps and APA-style summaries of your results for 20c and 24.

Points: Ch 14 #18, 3 pts, #20c & # 24, 6 pts each.

Homework 8: Correlation & Regression (15 pts)

Ch 15, problems 2, 6ade (by hand), 9 (using SPSS), 14, 24 (by hand). For problem 9, after finding the correlation for the data in the book (*EXTRA STEP*), change the correlation substantially by adding an outlier (make up the data for this person). Hand in annotated printouts for both original and modified data sets (identify which is which, and write down the data for the outlier you added), including an explanation of results (APA-style summary). Explain on the modified printout what you learned from the exercise about the possible impact of a single case on correlation.

Points: Problems #6 & #9, 5 pts each; #2 & #14, 1 pt each, #24, 3 pts.

Homework 9: Chi-Square (15 pts)

Ch 16, problems 4, 8, & 20. Do all chi-square problems by hand, showing all work and going step by step, and explaining the answer to the research question at the end in an APA-style summary. In addition, do problem 20 using SPSS (be sure to request EXPECTED as well as OBSERVED counts). Annotate printout.

Points: Ch 16: 4 pts each for 4, 8, 20 by hand, 3 pts for #20 SPSS