Psychology 302: STATISTICAL METHODS
242 Gerlinger Hall, MW 14:00-15:20 (2-3:20 pm)
Labs: Monday 4-5:20, Tuesday 2-3:20, Wednesday 10-11:20, 180 Straub Hall
Instructor: Bridget Klest, M.A.
Office: 353 Straub
E-mail: bklest@uoregon.edu,   **Phone:** 346-4966 with voice mail   **Office Hours:** TBA
Teaching Assistants: Mark Reid, mreid1@uoregon.edu, 337 Straub, 346-5770, office hours TBA
                Sopagna Eap, seap@uoregon.edu, 320 Straub, 346-4990, 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. Please keep this in mind as you approach this course.

Requirements

1.   Sufficient 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 class and do the exercises, you will get full credit.

2. Homework will be assigned each week on Monday, and will be due **in class** the following Monday. Answers to homeworks will be given in lab sections, the first of which is on Monday afternoon. Therefore, **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. 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, but you may use a calculator and the instructor will provide any necessary formulas on the quiz. At the end of the term, your lowest quiz score will be replaced with your highest quiz score (that is, you get to "drop" one quiz). Therefore, *there will be no makeup quizzes*. If you miss an exam, that score of "0" will count as your lowest score.

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 are 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 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 offic 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.
5. **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.

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 bonus points even if some assignments are handed in late, as long as all assignments are eventually handed in.*
 5% Sufficient participation in in-class exercises

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

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

*If taking Pass/Fail

Rules and Policies

No late homeworks will be accepted. No makeup quizzes will be given. It is your responsibility to stay on top of things, plan ahead, and leave some wiggle room in case an unexpected emergency comes up. The instructor reserves the right to evaluate on a case-by-case basis *extreme and unusual* circumstances and make exceptions to this rule, should it seem fair. Getting sick with a cold, having to work, most "family emergencies," deaths in the family, and other things that can be expected to come up from time to time do NOT count as unusual circumstances, so plan ahead!

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. 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 individual's seating for test security purposes, to require and check ID for admission to tests.

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, to allow the instructor and TAs to plan accordingly.

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 so we can discuss strategies to promote your success in this course.

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.

Date	Topic	Readings	Quizzes/Assignments
4/3	Course Introduction		
4/5	Scaling, Frequency Tables, Histograms	Ch. 1-2	
4/10	Central Tendency and Variability	Ch. 3-4	HW 1 Due
4/12	Z-Scores and the Normal Distribution	Ch. 5	Quiz 1
4/17	Probability and the Normal Distribution	Ch. 6	HW 2 Due
4/19	The Distribution of Sample Means	Ch. 7	
4/24	Hypothesis Testing with z	Ch. 8-9	HW 3 Due
4/26	Introdution to the t-test	Ch. 10	Quiz 2
5/1	More about t: Independent vs. Related	Ch. 11	HW 4 Due
5/3	Analysis of Variance	Ch. 13	
5/8	More ANOVA		HW 5 Due
5/10	Advanced ANOVA	Ch. 14	Quiz 3
5/15	More Advanced ANOVA		HW 6 Due
5/17	Correlation	Ch. 15	
5/22	Regression		HW 7 Due
5/24	Chi-Square	Ch. 16	Quiz 4
5/29	NO CLASS		HW 8 Due
5/31	Which Test? What to use when	Decision Tree	
6/5	More Which Test?, Review and Recap	Review Sheet	HW 9 Due
6/7	Quiz 5		Quiz 5

HOMEWORK ASSIGNMENTS

*Put your name and lab number (1, 2, or 3 for M, Tu, and We, respectively) 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. The book has answers to odd-numbered problems in the back.

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, 10,14: 2 pts each; problem 18, 4 pts, 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 <u>three times</u>. 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. 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!). 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. 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 method and number steps, and end with answer to research question. 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?)

    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.

    Points: Ch 14 #8, 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. 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 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

TOP FIVE PITFALLS:

1. Passive listening and reading

Write, draw, figure. Think with a pencil to learn. Turn the concepts into something you do. To succeed, you must be able to **explain** and execute.

2. Spectator overconfidence

Watching someone go through the steps is a starting point only. You have to get in the pool to learn how to swim.

3. Beginner's luck

Doing it right once doesn't mean you can repeat the trick. Get it wrong to understand how the process works. Mistakes help you learn.

4. Trying to cram

Don't fall behind; it's too hard to catch up.

5. Giving up because you get stuck

Everyone gets stuck. Try a new tack. ***Ask for help.*** Play around. Just keep trying!

THREE WAYS TO DO WELL

1. Keep up and keep trying

Read assigned chapters early and often, come to lecture, start on homework immediately so you will finish on time. If you keep up and keep trying, the concepts will eventually sink in. Turn your homework in on time. Slog through those chapters even if you only understand half of what you read. The fog will clear if you just persist. Don't give up!

2. Work hard on understanding material in the first half of the course

If you have a pretty good feel for the concepts in the first half, the second half will deepen your understanding. If you don't grasp the concepts in the first half, the second half will make no sense. Seek help *early* when you are feeling lost.

3. Stay in touch, and speak up

Come to office hours. You have a dedicated and knowledgeable instructor and two dedicated and knowledgeable TAs, and we want to help! Ask questions--in class, in lab, by e-mail, on Blackboard. Forming a clear question helps you discover what you do and do not understand, which is vital to mastering this subject.