### Statistical Methods PSY 201

**Instructor:**

**Email:**

**Phone:**

**Office:**

**Office Hours:**

**Required Text**

Carlson, K., & Winquist, J. (2018). *An introduction to statistics: An active learning approach* (2nd ed.) Thousand Oaks, CA: Sage Publications. ISBN 9781483378732.

This is a dramatically revised second edition so you cannot use the first edition of the book.

**Required Calculator**

You will be required to use a calculator with a statistics mode. *You may not use a cell phone as a calculator in this course.* If you do not already have a calculator with a statistics mode you should be able to purchase one for around $15. If you need to purchase a calculator the following are good choices for around $15: TI-30XS, TI-30X IIS. You could also spend around $80 for these choices: TI-83, TI-84. I recommend the cheaper ones because they will do all that you need for this course. If you already have a calculator *with a statistics mode*, it should work well for this course.

**Office Hours, Tutoring, and Academic Support**

I have scheduled office hours each week, but I am available at other times as well. If you would like to meet with me, just send an email with times you are available and we can set up a time to meet.

We will also have student tutors hold regular office hours each week. These hours will be posted on Blackboard as soon as they are available.

If you need additional help, I encourage you to contact the Academic Success Center. For this course, they can help connect you with a peer tutor for this course.

**Course Objectives**

The two main objectives of this course are to teach you to be: (1) a good consumer of statistical information; and (2) a good producer of statistical information.

A basic understanding of statistical methods is one aspect of being a well-educated person in today's society. Advertising claims, medical decisions, political decisions and commentary, and many other everyday activities are often presented or justified in statistical terms. Unfortunately, often the statistics used in many of these cases are misleading or deceptive. Therefore, it is critical that educated people be able to interpret statistics so they can guard against being manipulated and make decisions based on the best information available. The first goal of this course is to teach you how to be a good consumer of statistical information. Being a good consumer of statistical information will benefit you in innumerable ways. The second goal of this course is to begin to teach you how to be a good producer of statistical information. Often the information you need to make a quality decision is not available and you have to generate it. This course will start to teach you how to use data to answer questions that interest you. Being a good consumer and producer of statistical information are beneficial in every walk of life.

**Student Learning Objectives**

The Student Learning Objectives (SLOs) for this course are:

1. Students will be able to compute and interpret basic descriptive statistics (e.g., mean, median, mode, standard deviation, z scores).
2. Students will be able to use null hypothesis significance testing procedures appropriately. Specifically, students will be able to:
   1. State the null and research hypotheses
   2. Compute degrees of freedom and define a critical region
   3. Compute statistics using a calculator
   4. Compute an effect size
   5. Summarize the results of a study
3. Students will demonstrate an understanding of the logic of hypothesis testing including p-values, Type I errors, Type II errors, statistical power, and effect sizes.
4. Students will be able to compute and interpret confidence intervals.
5. Students will be able to determine which statistic is appropriate in different situations.
6. Students will be able to create and interpret graphs.
7. Students will be able to generate and interpret SPSS output for all of the statistics described above.
8. Students will appreciate and value statistics.

**Course Structure**

The course has been designed to minimize lectures and to maximize your active learning of the material. Although I will give brief lectures most days, the vast majority of your time will be spent working on activities that were designed to help you develop an understanding of the material.

Before most class sessions you will need to read a chapter and complete reading questions. During class you will complete an activity on the same topic as the reading. After completing the reading, reading questions, and activities, you will take a practice test on each chapter. Finally, before taking the exams you will also complete a unit practice exam.

**Reading Questions**

Reading questions are embedded in each reading assignment. You must submit your answers to these reading questions before class by entering them into Blackboard. After you enter your answers, Blackboard will indicate which items you answered incorrectly. If any of your responses were incorrect you can reread the relevant portion of the chapter, correct your answer, and then resubmit your answers. Your grade on the reading questions will be the ***AVERAGE*** of your first and second attempt. *You may only take the reading questions twice*. These reading questions are not intended to be difficult. If you actually read the assigned chapters you will find that most of the reading questions are very straight forward.

At the end of the course, reading questions will be worth 50 points. Your reading question points will be computed as a proportion of reading questions you answered correctly times 50.

**Activities and Practice Exams**

The activities in this course will prepare you for exams. You will be able to finish many activities during class but you will be expected to complete activities outside of class. All of the answers to these activities will be provided on Blackboard. Your goal when completing the activities is to understand the material rather than simply get the right answers. To earn points for completing the activities, *you will need to turn in the activities no later than the day indicated on the syllabus*. The final answers for all activities are provided on Blackboard, therefore, you must show your work. If you turn in your activity on time, complete, and with your work shown, you will earn full credit for that assignment. If it is only partially complete, your work is not shown, or it is turned in late, you will receive partial credit. Under extenuating circumstances, extensions may be given, but only if I approve the extension in advance. *Under no circumstances will activities be accepted after the exam covering that chapter was given*.

I have structured this course so that we have one day scheduled in class when you will take a practice exam before the actual exam. This will give you time to determine what you understand and what you still need to work on. If the practice test does not go well, I encourage you to review the material that you missed and then do the chapter practice tests on Blackboard. I have also scheduled the exams so that you have five days between taking the practice exam and taking the graded exam. This gives you ample opportunity to review, meet with me, and/or seek help from a tutor. Unit sample exams must be taken on the day listed on the syllabus. Under extenuating circumstances, extensions may be given, but only if I approve the extension in advance.  *Under no circumstances will practice exams be accepted after the exam covering that chapter was given*.

At the end of the course, activities and practice exams will be worth 100 points. There are 40 activities and practice exams and each is worth 2.5 points.

**Pop Quizzes**

*At least* one unannounced quiz will be given within each unit. These quizzes will include content that was covered on that day or on previous days. The quizzes will be given during the last 10-15 minutes of class.

You can earn up to 2 percentage points on each of the exams by completing these pop quizzes. If you have an A or B average on these quizzes you will receive a 2-percentage-point bonus. If you have a C average you will receive a 1-percentage-point bonus.

If you miss a pop quiz you will receive a 0 on that quiz. Only students with prior documentation will be able to make up pop quizzes. If you miss the quiz without documentation you receive a zero for that quiz. I understand that sometimes you may be too sick to come to class but not sick enough to go to the doctor. If that is the case you will be allowed to make up the pop quiz if you email me before you miss class.

**Attendance Policy**

*Class attendance:* You are expected to be in class working on statistics during the entire 75-minute class session. You should not be surfing the net, replying to e-mails, or working on things for other courses. There is always something to do in this class. If you completed the activity you can: (1) do the chapter practice test; (2) read the next chapter; or (3) enter reading question answers into Blackboard. There is always something you can be working on for this class.

*Exam attendance:* All exams were designed to be completed in the classroom during the class period, although I will allow you to have up to 2 uninterrupted hours to complete all exams. However, all exams must be completed within 2 hours of the time the class session started. In other words, if you are late to an exam you still must have your exam completed within 2 hours of the official exam start time. If you want to start the exam early, you may, but you will still be allowed a maximum of 2 hours to complete the exam. Additionally, you must complete the exam in one session, you may not start the exam, leave, and then come back to complete the exam. If you have documentation from Disabilities Support Services you will be allowed the additional time they recommend. *If you miss an exam without previously notifying me, you may take it late but* *10% will be deducted from your exam score for* ***each calendar day*** *that passes before you complete the exam.* If you must miss an exam because of a University-sponsored event or because you are sick you must contact me before the exam or the 10% deduction will be applied to your exam score.

**Computer Requirement**

Computers profoundly expedite the production of statistical information. Therefore you will learn how to use them and be required to use them when you complete some activities. You will be using SPSS (Statistical Package for the Social Sciences). You can access this program on any campus computer. If you need access at home, contact IT for help.

**Student Assignments and Assessment**

Your grade for this course will be based on 4 exams (100 points each), a comprehensive final exam (150 points), reading question assignments (50 points as a set), and activities and practice exams (100 points as a set).

Your final grade will be the percent of points you receive out of the 700 points that are possible. The following grade cuts will be used:

93 to 100% = A 87 to 89.9% = B+ 77 to 79.9% = C+ 67 to 69.9% = D+

90 to 92.9% = A- 83 to 86.9% = B 73 to 76.9% = C 63 to 66.9% = D

80 to 82.9% = B- 70 to 72.9% = C- 60 to 62.9% = D-

Below 60% = F

At the end of the semester I will use the following formula to compute your final course grade:

Final Grade = ((Test1% + Test2% +Test3% + Test4% + (proportion correct on all reading questions \* 50) + Activity and practice test points + (proportion correct on Final \* 150))/700.

In Blackboard there will be a column labeled “Current Grade” this is your current grade in the course. *The total points column in Blackboard does not reflect your grade*.

**Academic Honesty and “Working Together” on Homework**

The policy for *exams* is INDIVIDUAL WORK. Group work during exams will not be permitted. The time for learning from each other is during the activities, additional problems, and practice tests. However, it is important to note that it is inappropriate to copy any portion of another student’s work even if that student took the course during a previous semester. “Working together” is not equivalent to “copying.” Working together means that each person is actively engaged in trying to understand the material not just “getting the right answer to turn in.” If you have any questions about what constitutes appropriate “working together” you should ask me. Of course, I expect you to uphold the honor code of the University in its entirety: “I have neither given or received, nor have I tolerated others’ use of unauthorized aid.” Using another’s completed course work is unauthorized aid. I expect you to do more than simply follow rules. I expect you to act honorably in all of your exchanges with me. I will act honorably when I interact with you.

The “use of unauthorized aid” includes but is not limited to using notes on an exam, looking at another student’s exam, talking with another student during the exam, using a cell phone during the exam, obtaining any information about any course work that was not announced in class, deviating from established testing procedures in any way, and turning in work that is copied or not your own.

**Disability Support Services**

Please contact Disability Support Services if you believe you have a disability that might require a reasonable accommodation in order for you to perform as expected in this class. They will work with you and me directly to make sure you receive any reasonable accommodation needed as the result of a disability.

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| **Date** | **Reading Questions due before class via Blackboard** | **Activities to do before class** | **Activities and Assignments we will do in class that you may need to complete outside of class** |
| Week 1 |  |  | * Assessment surveys |
| Week 2 | Ch 1 RQ:  Frequency Distributions |  | * Activity 1-1 (SPSS) |
|  | Ch 2 RQ:  Central Tendency |  | * Activity 2-1 |
| Week 3 | Ch 3 RQ:  Variability |  | * Activity 3-1 |
|  | Ch 4 RQ:  z Scores | * Activity 4-1 | * Practice Exam and Review * All activities are due at the beginning of class |
| Week 4 |  |  | **Exam 1 (100 points)** |
|  | Ch 5 RQ:  Distribution of Sample Means and z for a Sample Mean |  | * Activity 5-1 |
| Week 5 |  | * Activity 5-2 | * Applied Activity on sampling error (not in book); confidence interval; error bars; boxplot |
|  | Ch 6 RQ:  Hypothesis Testing |  | * Activity 6-1 |
| Week 6 |  | * Activity 6-2 | * Activity 6-3 |
|  |  | * Activity 6-4 | * Practice Exam and Review * All activities are due at the beginning of class |
| Week 7 |  |  | **Exam 2 (100 points)** |
|  | Ch 7 RQ:  Single Sample t |  | * Activity 7-1 (SPSS) |
| Week 8 | Ch 8 RQ:  Confidence Intervals |  | * Activity 8-1 (SPSS) |
|  | Ch 9 RQ: Related Samples t |  | * Activity 9-1 (SPSS) * Activity 9-2 (SPSS—I’ll give you the output file) |
| Week 16 | Ch 10 RQ: Independent Samples t |  | * Activity 10-1 |
|  |  | * Activity 10-3 (choose stat) | * Activity 10-2 (SPSS) |
| Week 17 |  | * Activity 10-5 (SPSS—I’ll give you the output file) | * Activity 10-4 (collect data in class; SPSS) |
|  |  |  | * Practice Exam and Review * All activities are due at the beginning of class |
| Week 18 |  |  | **Exam 3 (100 points)** |

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|  | Ch 11 RQ:  One-way ANOVA |  | * Activity 11-1 * Activity 11-2 (SPSS—I’ll give you the output file; write up) |
| Week 19 |  | * Activity 11-4 | * Activity 11-3 (SPSS) * Activity 11-6 (choose stat) |
|  | Ch 12 RQ: Two-Factor ANOVA |  | * Activity 12-1 * Activity 12-5 (choose stat) |
| Week 20 |  | * Activity 12-2 (write up) | * Activity 12-3 (SPSS; write up) |
|  |  | * Activity 12-4 (review ANOVAs) | * Practice Exam and Review   All activities are due at the beginning of class  11-5 is not required, but gives more practice writing up one-way ANOVAs |
| Week 21 | **Thanksgiving Break** | | |
|  |  |  | **Exam 4 (100 points)** |
|  | Ch 13 RQ: Correlation and Regression |  | * Activity 13-1 (SPSS) * Activity 13-3 (SPSS) |
| Week 22 |  | * Activity 13-5 (choose stat) | * Activity 13-4 * Assessment Surveys |
|  | Ch 14 RQ: Chi Square |  | * Activity 14-1 * Activity 14-2 * Activities 13-1, 13-4, and 14-1 due at the end of class |
| Week 23 |  | * Complete the Practice Final | **Comprehensive Final Exam (150 points)** |