### STATISTICAL METHODS IN PSYCHOLOGY

PSY 302 | Winter 2015 | CRN 25160 Jason Wallin, Robbie Ross, Job Chen

oes early adversity relate to later risky important tool for a lifetime of careful, critical decision making? Is emotional development thought. different for children of peaceful marriages compared to those of marriages marked by conflict? Over the next 10 weeks, you will learn graphing and Do we more easily process scenes about actions with tabling techniques to display sets of data. You will which we are expert than those with which we are calculate descriptive and inferential statistics by hand novices? Can an eight-week parent training program and using statistical computing package popular in change children's ability to sustain their attention? psychological research. Most importantly, you will Do atheists and theists differ in their social understand the results of those calculations, how to behaviors? Does having an imaginary friend interpret the output of the by-hand and computer influence cognitive development? algorithms that you are learning, and how to select statistical techniques appropriate to a variety of Psychologists want to find out answers to questions research questions.

In this class, you will learn the basics of frequentist statistics, which is one approach to solving this problem. Statistics are the lingua franca of the sciences, an essential skill for graduate study, and an

Students can enter their first statistics course thinking the topic intimidating. By the end of our time together, I hope you find it a little less so, and (dare I say?) even a little interesting.

You will learn some math in this class, but 302 you want to remember, and on those things that isn't really a math class. It's perhaps more similar don't make sense to you. Ask your instructors to an engineering course than it is like many about your readings. traditional math courses you might have taken. That is, we will focus on applications and A most important point: Do not get behind in understanding--on getting stuff done with math-- this class! Each chapter, each lecture, each rather than simply crunching numbers.

the right answer when you plug numbers into an probably too late. equation. Instead, our focus is on conceptual understanding of statistics. How do formula Check your e-mail and the Blackboard site often, do they tell us about our question of substantive information using each. interest?

notes. Go to office hours.

assigned chapters and assignments before class etc. and take notes (don't just highlight!) on things

assignment builds on knowledge and skills from those preceding. If you are struggling early on, it So, while we will work through formulae is going to be very difficult to catch up. Talk to together, our intent is not that you can your instructors earlier, rather than later. If mindlessly step through some algorithm, getting you're waiting until the end of the term, it's

"behave?" What do the outcomes mean? What as we will be frequently posting important

This is a four-credit course. According to This course employs traditional lectures and University principles governing credit and weekly lab meetings. To succeed, you should contact hours, each credit should be associated plan on frequently attending all lecture and lab with about 30 hours of work over the term. That sessions. Be engaged. Ask questions. Take great means you should plan on about 120 hours (10-12 hours a week) of work dedicated to this course. This includes 4 hours a week of lecture Come prepared to lectures and labs. Read the and lab, plus 8 hours a week of ding, homework,

All students. The University of Oregon is early) if planned well ahead of time. working to create inclusive learning environments. Please notify me if there are Academic integrity. We take academic aspects of the instruction or design of this integrity seriously. Cheating is defined as course that result in disability-related barriers to providing or accepting information on an exam, your participation. You are also encouraged to plagiarism or copying anyone's written work, or contact the Accessible Education Center allowing someone else to copy your work. In (formerly Disability Services) in 164 Oregon addition, lying to try to get points (e.g., lying Hall at 541-346-1155 or uoaec@uoregon.edu. about having turned in an assignment on-time) is considered academic dishonesty and will be If you are repeating this class, or if you are a treated as cheating. Discovery that a student has student with children, a job, or have other cheated will lead to a grade of F in the course circumstances that might affect your ability to for that student, and we will inform UO's devote time to the class, please let me know student conduct coordinator. We retain the right now so we can discuss strategies to promote to assign seats for tests, to change an your success in this course. If you wait until you individual's seating for test security purposes, have problems in the course it may be too late to and to require and check ID for admission to salvage your grade, but planning ahead will tests.

likely lead to success

That said, we strongly encourage you to work Student athletes. You must let me know during collaboratively with other students when the first week of classes if you will miss class puzzling through readings or working on due to travel with a UO athletic team and homework. But the work you generate, the require accommodation. Requirements for the homework, quizzes, and exams you submit, course will not be relaxed for student athletes, must be entirely your product. however minor scheduling accommodations may be made (e.g., taking a quiz a few hours

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## Who, what, when, \_\_\_\_\_\_where?





Robbie Ross runs labs on Mondays (12:00-1:20, 2:00-3:20, and 4:00-5:20) in 006 Straub. Her office hours are on Thursdays from 3:00 until 5:00 in 432 Straub.



**Job Chen** runs labs on Tuesdays (8:30-9:50, 10:00-11:20, and 12:00-:20), also in 006 Straub. His office hours are on Mondays and Wednesdays from 2:00-3:00 in 339 Straub.



Jason Wallin runs the lecture sessions on Mondays and Wednesdays, 8:30 9:50 in 101 Jacqua. His office hours are Mondays from 3:00 until 5:00 in 432 Straub.



You will need to purchase access to the Aplia online course, which you can do through the bookstore. This application includes an electronic version of your textbook and it will be where you complete a majority of your homework assignments. In addition, it includes valuable study tools, so be sure to browse the application and take advantage of it. Instructions for getting up and running with Aplia are available on Blackboard.

Our textbook for the term is Gravetter, F. J. & Wallnau, L. B. (2014). Essentials of statistics for the behavioral sciences (8th ed.). Boston, MA: Cengage. On-line access for this text comes bundled with your Aplia subscription (see above)--you do NOT need to purchase an additional paper copy of the text.

We will also make use of use of iClickers for in-class participation beginning in week 2. Clickers used for previous courses should work. You will find instructions for registering iClickers on Blackboard. You do NOT need to bring iClickers to lab, just to lecture.

You must also have access to Blackboard (http://blackboard.uoregon.edu), which we will use for course management this term. Assignments will be posted to Blackboard, and it is where you will submit your SPSS homework. You will also find there grades, lecture notes, lab handouts, study guides, and other support.

Finally, you will want to bring a reliable calculator to lecture each day, including quiz days. You CANNOT use your cell phone as a calculator during quizzes.

## MATERIALS





We will have five unit quizzes this term. Each will be 40 minutes long and will feature 30-35 fixed response items. Only your best four quizzes will count, and each will be weighted at 10% of your final grade. Because you have the opportunity to drop your lowest quiz, I will not provide makeup exams. I might be able to offer quizzes in advance of class for students who will be away for university-sanctioned events. This will require notice well in advance of the quiz, however.

The final exam will be cumulative. I will test, especially, themes common to 20% multiple chapters across the quarter (e.g. the logic of hypothesis testing, effect sizes, confidence intervals), and selecting the appropriate test statistic for a **Final** research design. This exam, too, will be fixed response items. I will write it to take between 60 and 90 minutes.

20% Aplia

I will assign 10 homework activities through Aplia; some will cover two or more chapters. These are due each Tuesday, and must be submitted through the Aplia software no later than 5:00 pm. You cannot submit Aplia assignments late.

13.5% Lab HW

6.5%

Participation

I will assign 9 homework assignments (one each week except for week 3, when we have no labs). You will submit these to Blackboard electronically. by Tuesday at 5:00. You cannot submit lab work late.

You will earn participation by a) answering iClicker questions, b) generating multiple choice questions for our practice tests, and c) completing two week 1 activities. Other activities may be added in the term. The average of the top 4 students will become 100% participation for the term.

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**NO** 

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How



### What will the distribution of grades look like this term?

Hint: The answer is kinda up to you all.



Positively Skewed?

**Negatively Skewed?** 











# **RATIONALE** STUDENT OUTCOMES

#### Rationale

University of Oregon: a "commitment to and set of data, complete basic data analyses, and undergraduate education, with a goal of helping the summarize the results in an APA-style report." indivdiual learn to question critically, think logically, communicate clearly, act creatively, and live ethically".

Additionally, PSY 302 is aligned with the knowledge to new situations and master the content American Psychological Association's Guidelines of Psychology 303 (Research Methods), students for the Undergraduate Major.<sup>2</sup> The second goal of those guidelines relates to scientific inquiry and critical thought, including the ability to 'interpret, design, and conduct basic psychological research."

In 302, you will acquire a set of tools to aid your critical inquiry, contribute to a reasoned life, and help you make the best use out of the findings of psychological science.

Finally, PSY 302 aligns with one of the basic assessing the size of an effect in a sample (e.g., the that the UO learning goals<sup>3</sup> Department has for all psychology majors. The total variability in the sample (e.g., the standard department holds that all majors should be able to deviation around means). Students need

### **Student Outcomes**

Students of PSY 302 learn a variety of statistical terms and procedures. To successfully apply their also need to acquire a more abstract level of understanding that underlies specific skills.

Here we specify both these abstract principles and the more specific skills:

Principle 1. One goal of statistics is measuring the strength of a potential effect, such as the size of any difference between groups/conditions or the relationship among variables. This is done by Psychology difference between two groups) in relation to the to

"choose appropriate basic statistical understand how this principle applies to different appropriate for a given research question and data PSY 302 is aligned with a primary mission<sup>1</sup> of the analysis techniques for a specific research question designs and data sets (e.g., correlation, analysis of structure. variance).

Principle 2. Inferential statistical tests allow us to including entering data in the appropriate format, make yes/no decisions about hypotheses by selecting options to get the data needed, and identifying the "range of data situations" that is running appropriate tests. plausible if the null hypothesis (i.e., no difference Skill 4. Extract key information from the output of among groups or relationship among variables) is SPSS analyses to assess the plausibility of test correct. For example, under the null hypothesis the assumptions, make decisions about hypotheses, and distribution of sample differences between two create tables or figures to illustrate the results. groups has a mean of zero with a standard error determined by variance and sample size. For an Skill 5. Summarize the results of data analyses analysis of variance the null hypothesis sampling within an APA-style report, using appropriate distribution is defined by the ratio of betweenterminology and providing statistical an group and within-group variance.

Skill 1. Upon reading the description of a study, infer the research question, hypotheses, and study design, and identify the nature of variables involved (dependent independent, scales of VS. measurement).

Skill 3. Complete statistical analyses in SPSS,

interpretation in light of the research question. This includes presenting the results of hypothesis tests along with appropriate measures of effect size or confidence intervals and relevant descriptive statistics.

http://pages.uoregon.edu/uosenate/UOmissionstatement.html)

<sup>&</sup>lt;sup>2</sup> http://www.apa.org/ed/precollege/about/psymajor-guidelines.pdf

<sup>&</sup>lt;sup>3</sup> http://cas.uoregon.edu/learning-outcomes/