

# Statistical Methods (PSY 3000/3005, CRN 43031)

Spring 2014, Jan. 6 – May 1

Prof. Robert Carlson

## Class Information

Lecture Days: Tues. & Thur.  
Lecture Time: 10:30 – 11:45  
Lecture Location: McDonald 104  
Lab Days: Thur.  
Lab Time: 2:30 – 4:15  
Lab Location: McDonald 111

## Contact Information

Office: McDonald 222  
Phone: 652-7893  
E-mail: rcarlson@dixie.edu

**Disclaimer**: Details of this syllabus are subject to change (I hope not, but you never know).

**Contacting Prof. Carlson**: The most effective way to contact me is by e-mail (contacting me through Canvas will generally be ineffective, however). I check my e-mail regularly, and I am much more likely to remember to respond to an e-mail than to a comment made to me before or after class (I tend to forget those comments, unfortunately). If you speak to me in person, especially away from my office, **make sure to follow up any conversations with an e-mail** to remind me to address the matter in a timely manner. I may not be in my office a lot outside of office hours, but you are welcome to drop by any time to see if I have time to meet with you. If you want to be sure I will be there to talk with you during a time other than official office hours, please feel free to contact me via e-mail to make an appointment. I am happy to work with you on your lab assignments or understanding any of the material. There are also Psychology tutors, at least one of which is traditionally chosen because they have excelled in this course in a previous semester.

**Course Summary**: The purpose of this course is to introduce Psychology majors to the use of statistics within the behavioral sciences. Students will learn how to *apply* statistical principles, instead of merely memorizing a set of equations, in a variety of research contexts within the behavioral sciences. This course should prepare students to succeed in a Psychology Research Methods course.

## **Course Information**:

Textbook: *Fundamental Statistics for the Behavioral Sciences*, 7<sup>th</sup> Edition, by David C. Howell

Study Guide: Online study guide (as of now, incomplete) provided for your convenience

Office Hours: Tue., Thu. 1:00-1:50; Mon., Wed., Fri. 11:00-11:50

Prerequisites: Math 1040; PSY 2000

Course Fees: None

General Education: This course does not fulfill any general education requirements.

**Prerequisites**: Math 1040 serves as a basic introduction into the mathematical side of statistics—how to calculate simple results using statistical formulae. PSY 2000 provides a background in writing according to APA style guides, which is required when presenting results in lab.

**Attendance Policy**: Students are expected to attend every class (lecture and lab) and participate in class discussions. There is a lot of material to learn in this course, and it is not easily learned in the abstract; it is vital for students to actively participate in learning the material, through class discussions and actively completing laboratory assignments. If you are going to perform well in this class, you must plan on staying on top of the work every week of the semester.

**Classroom Policy:** This is a relatively small class, and all students are expected to participate in classroom discussions and lab activities. This material is best learned through active participation and application. Combined with the lab, this will be a hands-on course; passive learning is a very inefficient way to learn how to *apply* statistical techniques.

**Academic Honesty:** It is extremely important that students present their own work for grading in this course. I cannot accurately evaluate how much you have learned if you are turning in someone else's work. Although collaboration among students regarding the general approach to completing assignments is encouraged (groups working together in lab and studying together outside of class is a very good way to learn), the specific work that is submitted must reflect an individual student's own work, including your own wording of lab assignment answers (graphs, open-ended questions, etc.).

Grading Scale	
Grade	Range
A	>90%
A-	88-90%
B+	85-87%
B	81-84%
B-	78-80%
C+	76-77%
C	72-75%
C-	68-70%
D+	65-67%
D	61-64%
D-	58-60%
F	<58%

**Grading Information:** Final grades in this course will be based on a percentage-based system, and there will **not** be a "curve" used to determine grades.

**Grade Components:** Quizzes (10%), Lab Assignments (25%), Midterm Exams (45%), Final Exam (20%).

**Quizzes.** Quizzes may be given each class period; if there is a quiz, it will usually be given at the beginning of class. Each quiz will be a short test of your knowledge of that class's reading assignment. In-class quizzes will typically be very short and can be completed in less than five minutes. Other quizzes will need to be completed outside of class. These quizzes must be completed independently; **do not copy another student's work.**

**Lab Assignments.** Plan on having a lab assignment due **every week.** Each assignment will be introduced in lab, including an elaboration of the material that was discussed in class which will be relevant for the assignment. Explanations about the use of statistical software (mostly Excel) will be also given during Lab, along with handouts available through Canvas on how to use Excel. There will always be time available during lab to work on that assignment, but lab assignments will be due at least 4 days after they are assigned. **As much as possible, lab answers must be submitted in APA format.** The average percentage score of each lab assignment (**not** total lab points) will count toward 25% of your course grade. See the Lab Guide for more information about lab.

**Midterms.** Midterms will test your knowledge of an entire section of the course (usually 5-6 chapters). Midterm test questions will involve true/false and multiple choice questions, as well as questions that will require students to demonstrate their ability to apply the statistical principles learned in class, but with minimal calculations. There will be four midterm exams during the semester; the midterm that you had the highest percentage score on will count more toward your final grade than the other midterms; It will contribute 15% toward your final grade while the rest of the midterm grades will each contribute 10% toward your final grade. All midterm exams will be administered in the Testing Center, according to the schedule below.

**Final Exam.** The final exam will be administered at the end of the semester and will cover material from the entire course. It will be equivalent to a longer midterm exam. Everything covered during the semester will be covered on the Final Exam.

**Grade Calculation:** Grades are calculated based on percentages, **not total points.** For example, if you score 9 out of 10 on one lab assignment, that counts as a grade of 90%; if you score 70 out of 100 on another lab assignment, that counts as a grade of 70%. If those were your only two lab assignments, your Lab Average would be 80% (the average of 70% and 90%), **not** 72% (79 out of 110 total points). The same principle applies to quizzes and midterm exam grades. Your Quiz Average (QA) will be calculated by averaging the percentage scores from each

quiz, and your Lab Average (Lab) will be calculated the same way. Multiply your highest midterm (HM) percentage by .15 and the rest of your midterms (RM) percentages by .10 each. To calculate your overall grade, use the following formula:

$$(QA * .10) + (HM * .15) + (RM * .10) + (RM * .10) + (RM * .10) + (Lab * .25) + (FE\% * .25)$$

This sum will be your total percentage grade in the course; use this figure to determine your letter grade in the course based on the Grading Scale listed above.

<u>Date</u>	<u>Reading Assignments/Course Events</u>	<u>Ch:Pages</u>
Tue., Jan. 7	Introduction	1:1-14
Thu., Jan. 9	Basic Concepts	2:17-31
Tue., Jan. 14	Frequency Distributions and Graphs	3:35-55
Thu., Jan. 16	Measures of Central Tendency (Lab 1 due)	4:63-76
Tue., Jan. 21	Basics of Variability	5:80-93, 98-100
Thu., Jan. 23	Normal Distribution and Frequency (Lab 2 due)	6:111-120
Tue., Jan. 28	Standard Normal Distribution and $z$ -Tests	6:120-130
Thu., Jan. 30	<b>Review for Exam 1</b> (Lab 3 due)	<b>Ch. 1-6</b>
Jan. 30 – Feb. 3	<b>Exam 1 in Testing Center</b>	<b>Ch. 1-6</b>
Mon., Feb. 3	Lab 4 due (9:00 a.m.)	---
Tue., Feb. 4	Sampling Distributions and Null Hypotheses	8:156-169
Thu., Feb. 6	Hypothesis Testing	8:169-185
Tue., Feb. 11	Scatterplots and Correlation	9:188-201
Thu., Feb. 13	Factors that Affect Correlations (Lab 5 due)	9:201-226
Tue., Feb. 18	Linear Regression	10:230-243
Thu., Feb. 20	Regression Predictions (Lab 6 due)	10:243-262
Tue., Feb. 25	<b>Review for Exam 2</b> (Lab 7 due)	<b>Ch. 8-10</b>
Feb. 25-Feb. 26	<b>Exam 2 in Testing Center</b>	<b>Ch. 8-10</b>
Thu., Feb. 27	Sampling Distribution of the Mean	12:301-317
Tue., Mar. 4	$t$ -test and Confidence Limits	12:317-332
Thu., Mar. 6	Comparing Two Samples (Lab 8 due)	13:336-349
Mar. 10-14	<b>Spring Break</b> (no class)	---
Tue., Mar. 18	Independent Sample $t$ -tests	14:353-362
Thu., Mar. 20	Heterogeneity of Variance and Examples (Lab 9 due)	14:362-378
Tue., Mar. 25	<b>Review for Exam 3</b> (Lab 10 due)	<b>Ch. 12-14</b>
Mar. 25-Mar. 26	<b>Exam 3 in Testing Center</b>	<b>Ch. 12-14</b>
Thu., Mar. 27	ANOVA	16:406-427

Tue., Apr. 1	Post-hoc Tests	16:427-446
Thu., Apr. 3	Factorial Designs (Lab 11 due)	17:453-461
Tue., Apr. 8	Interactions	17:461-466, 470-474
Thu., Apr. 10	Chi-Square (Lab 12 due)	19:502-515
Tue., Apr. 15	Chi-Square, Part II	19:515-521, 526-530
Thu., Apr. 17	<b>Review for Exam 4 (Lab 13 due)</b>	<b>Ch. 16-17, 19</b>
Apr. 17-Apr. 21	<b>Exam 4 in Testing Center</b>	---
Tue., Apr. 22	<b>Final Exam Review</b>	<b>Ch. 21</b>
Thu., May 1	<b>Final Exam, McDonald 104, 9:30-11:30 a.m.</b>	<b>Everything</b>