**Psychology 343: Statistical Methods in Behavioral Science**

**Spring 2017**

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**Lecture:** Tuesdays and Thursdays, 3:30 - 4:45pm BSB 137

**Discussion Sections:** Friday, 10:00 - 10:50am ETMSW 2235

**Office hours:** Thursdays 2:00 – 3:30pm and by appointment

**Course Objectives:**

Welcome to Psch 343, more colloquially known as Stats and even more colloquially known as most students’ least favorite class. However! I deeply hope that you will not be one of those students. My goal this semester is for you to walk away an appreciation of how statistics can help answer the psychology questions that interest you (and therefore maybe you will even *like* statistics…maybe).

This course will build on concepts from Research Methods and teach you to use statistical methods to evaluate whether a data set supports a hypothesis. The first and most general goal of the course is for each of you to come away with a better understanding of some of the basic statistical techniques used in the field of psychology. This understanding will include the circumstances under which a given test should be chosen, how to conduct each test, and how to interpret the results. With these tools, you will be able to take a research project from raw data to a conclusion of whether a theory was supported or not and be able to communicate those results clearly. Second, I would like for each of you to come away from the course with a better understanding of how statistics are both used and mis-used. By learning what each of these statistical tests can tell us (or not tell us) about our hypotheses, you will each become better (and more critical) consumers of the statistics you encounter in the psychology literature and the media more generally. Finally, I hope to introduce you to the enormous abilities statistics grant us as researchers. I assume that because each of you chose psychology as a discipline, you are interested in how and why human behavior differs across people. This course will allow you to critically examine those differences using a wide variety of statistical techniques, no matter what particular psychological process is interesting to you.



**Prerequisites:**

Enrollment in this course is limited to students who have completed

* Research Methods in Psychology (PSCH 242) with a minimum grade of C
* ENGL 161 with a minimum grade of C
* Math 090 or Math 118 (or equivalents), with a minimum grade of C
* Must be a Psychology or Neuroscience major

All students who have not met ***all*** these prerequisites will be dropped from the course.

**Course Materials:**

Hand Calculator: Nearly any basic hand calculator will be suitable for this course as long as it can perform basic arithmetic (i.e. add, subtract, multiply, divide) as well as compute square roots and exponents. You should bring this calculator with you to all lectures, lab sections, and exams. **NOTE:** Graphing and cell phone calculators are not allowed on exams.

Textbook:

Statistics for Psychology, 6th edition.

Aron, A., Coups, E., & Aron, E. N. (2013).

Pearson.

The textbook is available at the bookstore, Amazon, etc.

**A note on the textbook**. Students often ask “Do I need the textbook? Is the textbook useful?”

The short answer is yes. The long answer:

* Statistics is a subject that can be taught in many different ways. One explanation of the mean may make perfect sense for student A, whereas a different explanation clicks for student B. The addition of a textbook allows me to give you several different ways of presenting the course material to help find the explanation that works best for you.
* We have a limited time during class. The textbook is used to supplement my lectures and my lectures will supplement the textbook.
* The best way to learn statistics is to do statistics. This is why we will often have in-class activities and worksheets. The book provides many additional practice problems and the answers. Students who do well in statistics classes are students that do statistics often.
* The book is AWESOME! I know this is hard to believe if you do not love statistics like I do (yet!), but it is true. The book has a lot of useful resources. Example: all formulas spelled out in plain English, step by step check lists for statistical tests, diagrams of how to work through formulas, and more!

**Grading:**

Course grades will be based on exams (60%), homework assignments (30%), and in-class assignments (10%).

|  |  |
| --- | --- |
| Grade | Percent |
| A | 89.5 – 100 |
| B | 79.5 – 89.4 |
| C | 69.5- 79.4 |
| D | 59.5 – 69.4 |
| E | 0 – 59.4 |

Exams (60%)

There will be four exams (including the final) offered during the course of the semester. You are required to take three of the four exams (therefore, each exam is worth 20% of your total grade). Three of the exams are non-cumulative and will be administered during the regular class period. The final exam is cumulative and will be administered during finals week. If you take all three exams and are satisfied with your scores, you may skip the final exam. If you missed any one of the first three exams or want to replace your lowest score with a better score, you must take the final exam. I will automatically use the best three of your four exam scores to calculate your final grade.

Homework Assignments (30%)

There will be several homework assignments throughout the semester (about one homework per week). One homework grade will be dropped. Homework assignments will be posted on blackboard. I will not accept electronic copies of your work. I will not accept late homework. Also, as a courtesy to me, please **staple** all pages of your homeworks together.

Homework assignments are due at the **beginning** of class. In order for your homework to be accepted you must stay for the entire class. Showing up only to turn your homework in will result in it not being accepted.

Furthermore, many of the homeworks will require you to compute statistics by hand. You MUST clearly show all of your work, including formulas. Why?

* It is important to write out each formula before you go on to use that formula in the assignment so I can clearly see your logical process. Example:

$$t=\frac{M- μ}{S\_{M}}= \frac{21- 23}{0.57}=-3.51 $$

* Many of the statistical procedures covered in this course will require multiple steps in calculating the final test statistic. If you make a mistake during one step in the process, it will influence every step following it. Showing your work allows me to give credit for the correctly done calculations that use a wrong number from an earlier step.
* Often incorrect answers are the result of simple arithmetic errors or mistakes entering numbers into the calculator. In these cases, partial credit (and normally most of the credit) can still be earned if the rest of the problem is done correctly.
* **If the final answer is correct but no work is shown, it will not receive full credit.**

In-class Exercises (10%)

There will be many unannounced, in-class exercises. You will receive either full credit or a 0 for each in-class exercise. These assignments are not intended to be difficult but are supposed to enhance your understanding of the topic discussed during class. To receive the full credit for the exercise, you are required to: (a) show up to class, and (b) participate in the exercise. The two lowest in-class exercise grades will be dropped (i.e. missed classes).

Missed In-class Exercises, Late Assignments, and Make-up Exams

As mentioned above, the two lowest in-class exercise grades, the lowest of the four exams grades and the lowest homework assignment grade will be dropped. I drop your lowest exam and homework for several reasons. The primary reason is that it eliminates the need for make-up exams and assignments. I understand that unforeseen circumstances happen, e.g. illness, medical emergencies, car troubles, overslept, traffic, my bunny was sick, etc. If this occurs, you do not need to worry about missing the in-class exercise, exam, or turning in the assignment because that exercise, exam, or assignment will be dropped. A second reason I drop the lowest exam is that everybody has a bad day now and then. If you happened to take an exam on a day you were not prepared and you were not satisfied with your score, you could take the final exam. If the score on your final is better than one of your previous exams, the earlier exam would be dropped from your final grade calculation. However, this can only happen if you take the first three scheduled exams. In addition, if you are happy with your first three exam scores, you are not required to take the final. The same is true of homework assignments; you may have a particularly busy week and as a result do poorly on a homework assignment. However, I encourage you to attempt every homework assignment because you may not know all of your homework assignment grades before the due date of the last assignment. Because of these policies, **make-up exams, late assignments, and make-up in-class exercises will be accepted only under the most extreme circumstances.** Extreme circumstances **do not** necessarily include instances where a doctor’s note is provided.

Example Grade Calculation (hypothetical)

If Student A earned the following scores (the slash through a score indicates a dropped grade):

Homework score Exam score In-Class Assignment score

HW 1 100 Exam 1 75 exercise 1 100

HW 2 90 Exam 2 82 exercise 2 100

HW 3 77 ~~Exam 3 0 (sick)~~ exercise 3 100

HW 4 60 Exam 4 79 ~~exercise 4 0 (missed class)~~

~~HW 5 25~~ exercise 5 100

HW 6 88 exercise 6 100

HW 7 92 ~~exercise 7 0 (missed class)~~

HW 8 84 exercise 8 100

HW 9 72

1. Sum your scores in each category, excluding the dropped assignment.

Homework: 663 Exam: 236 In –Class Assignment: 600

1. Divide your sums by the total number of assignments, excluding the dropped assignment.

Homework: 663/8 =82.9 Exam: 236/3 = 78.7 In-Class Assignment: 600/6 = 100

1. Weight the score in each category. Multiply the homework score by 0.30, the exam score by 0.60, and the in-class assignment score by 0.10. Then sum.

Final grade = 82.9(.30) + 78.7(.60) + 100(.10)

 = 24.87 + 47.22 + 10

 = 82.09

 = **B**

**Attendance**

Statistics is a unique class in that each topic builds directly on the previous one. If you miss a class, you run the risk of being completely lost in the next lecture. Consequently, it is important that you attend each lecture. While attendance is not part of your grade, the only way to receive credit for the in class assignments is to be in class.

If you miss class it is your responsibility to get the notes, handouts, homework assignments, and/or other announcements from one of your fellow classmates. If you are absent from class, do not ask me what you missed. Find someone in class that you can get this information from.

# Checking Blackboard:

Course materials will be posted on blackboard at least 24 hours before class. It is strongly recommendedthat you bring these materials with you to class.However,the materials posted on blackboard will not contain everything covered in lecture. It will be your responsibility to take notes to supplement the materials posted on blackboard.

It will also be your responsibility to keep track of your scores in Blackboard. If you notice that a score has been incorrectly entered into Blackboard, you must show the original paper with the correct grade to me no later than Monday of finals week.

**Communication:**

If you have questions or need help with the class, I strongly recommend coming to my office hours. If you have a brief question, I’ll be happy to answer it over email. However, if it is a question about the content of the course, I will most likely ask you to come to my office hours or schedule an appointment. When emailing me to schedule an appointment, please provide me with a range of time you are available to meet. Although this class is one of my highest priorities, I do have other obligations during the semester. If you send me an email, I hope to respond within 24 to 48 hours. If I have not responded after 48 hours, please feel free to send your message again.

**Academic Dishonesty:**

**In fairness to the vast majority of students who take their college career seriously, no form of cheating will be tolerated.**  If you cheat on any assignment in this class, you will fail the entire class and I will file official judicial charges against you immediately with the Dean of Students, who will place a notice about the incident in your permanent record. There will be no exceptions to this policy. (see Student Disciplinary Policy for what qualities are academic integrity: http://dos.uic.edu/docs/Student%20Disciplinary%20Policy.pdf)

Cheating includes, but is not limited to, looking on others' tests or letting them look on yours during a test, copying or giving others test answers, and plagiarism which includes copying the words of a fellow student or any other author in your papers, copying even short phrases from written work that you are using as a reference (even if you cite it properly), handing in work that you have handed in for another class, handing in papers you've gotten from the internet or from other students, etc.

**Students with Disabilities:**

Students with disabilities who require accommodations for access and participation in this course must be registered with the Office of Disability Services (ODS). Please contact ODS at (312) 413-2103 (voice) or (312) 413-0123 (TTY). If you have letter of accommodation, please give it to me during the first week of class so that I can, if necessary, plan accordingly.

**Incomplete Grades:**

University policy on incomplete grades is very strict and I follow that policy. I will grant an incomplete grade only under the most extreme circumstances. Do not request an incomplete unless the following conditions apply (taken from the undergraduate catalogue):

Course work is incomplete when a student fails to submit all required assignments or is absent from the final examination; incomplete course work will normally result in a failing grade. The IN (incomplete) grade may be assigned in lieu of a grade only when all the following conditions are met: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all course work due to unusual circumstances that are beyond personal control and are acceptable to the instructor; (c) the student presents these reasons prior to the time that the final grade roster is due. The instructor must submit an Incomplete report with the final grade roster for the IN to be recorded. This report is a contract for the student to complete the course work with that instructor or one designated by the department executive officer in the way described and by the time indicated on the report. In resolving the IN, the student may not register for the course a second time, but must follow the procedures detailed on the report. An IN must be removed by the end of the student’s first semester or summer session in residence subsequent to the occurrence, or, if not in residence, no later than one calendar year after the occurrence. When the student submits the work, the instructor will grade it and change the IN to the appropriate grade. If an undergraduate fails to meet the stated conditions, the instructor will assign an E for the final grade.

If you have any problems or concerns throughout the class, please come see me during my office hours, before it is too late at the end of the semester. I am happy to work with you during the semester to help facilitate your understanding of the course material. Please use office hours whenever possible, but we are willing to make appointments if your schedule makes it impossible to make my office hours.

**Observance of Religious Holidays**:

Campus Policy states, “The faculty of the University of Illinois at Chicago shall make every effort to avoid scheduling examinations or requiring that student projects be turned in or completed on religious holidays. Students who wish to observe their religious holidays shall notify the faculty member by the tenth day of the semester of the date when they will be absent unless the religious holiday is observed on or before the tenth day of the semester. In such cases, the student shall notify the faculty member at least five days in advance of the date when he/she will be absent. The faculty member shall make every reasonable effort to honor the request, not penalize the student for missing the class, and if an examination or project is due during the absence, give the student an exam or assignment equivalent to the one completed by those students in attendance. If the student feels aggrieved, he/she may request remedy through the campus grievance procedure.”

**Course Schedule\***

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| --- | --- | --- | --- |
| Week | Date | Reading | Lecture Topic |
| 1 | 1/10, 1/12, 1/13 |  | Introduction, Quantification, Scales of Measurement |
| 2 | 1/17, 1/19, 1/20 | Ch 1 | Visually Representing DataClass Canceled 1/19 & 1/20 |
| 3 | 1/24, 1/26, 1/27 | Ch 2  | Central Tendency, Variability |
| 4 | 1/31, 2/2, 2/3 | Ch 3 | Z scores, the Normal Curve, Sampling, and Probability |
| 5 | 2/7, 2/9, 2/10 | Ch 4 | Catch-up/Review, **Exam 1**, Review Exam1/Into to NHST |
| 6 | 2/14, 2/16, 2/17 | Ch 5 & 6 | Z-Tests, Making Sense of Significance |
| 7 | 2/21, 2/23, 2/24 | Ch 7  | One sample and dependent sample t-test |
| 8 | 2/28, 3/2, 3/3 | Ch 8 & Ch 9 | Independent samples t-test, One-way ANOVA |
| 9 | 3/7, 3/9, 3/10 | Ch 10 | Factorial ANOVA |
| 10 | 3/14, 3/16, 3/17 |  | Catch-up/Review, **Exam 2**, Review Exam 2 |
| 11 | 3/21, 3/23, 3/24 |  | **Spring Break!** |
| 12 | 3/28, 3/30, 3/31 | Ch 11 | Covariance & Correlation |
| 13 | 4/4, 4/6, 4/7 | Ch 12 | Simple Regression |
| 14 | 4/11, 4/13, 4/14 |  | Multiple Regression |
| 15 | 4/18, 4/20, 4/21 |  | Catch-up/Review, **Exam 3**, Review Exam 3 |
| 16 | 4/25, 4/27, 4/28 |  | Chi-Sq, Review  |
| FinalsWeek |  |  | Final Exam |

\*This schedule is tentative and subject to change.