**PSCH 343 Statistical Methods in Behavioral Science**

**Spring 2017**

**CRN: 33130 and 33131**

**Instructor:** Allison Mueller, Doctoral Candidate

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**Office:** BSB 3058

**Lecture:** Tuesdays and Thursdays, 9:30 – 10:45, BSB 137

**Discussion:** Fridays, 10:00 – 10:50, BSB 2019

**Office Hours:** Thursdays 11-1, or by appointment

**Welcome!**

Welcome to PSCH 343! I am excited to work with you this semester. Statistics is my absolute favorite class to teach. Why? What you learn here can truly shape how you see the world. The analytical thinking skills that you develop in this class can change the way you navigate your everyday life: changing how you think about sports, elections, and news from the media, for example. I look forward to helping you develop these skills!

**Course Goals & Objectives**

This is an introductory statistics course for students in the behavioral sciences. Although the course is tailored toward Psychology students in particular, if you are majoring in another social or physical science, you should be able to apply what you learn here to your own field of study.

This course will provide you with several opportunities:

* Preparation for future research and a career in the behavioral sciences (and many other types of fields!), including:
	+ An understanding of basic statistical concepts
	+ An ability to choose appropriate statistical analyses for various research designs
	+ An ability to perform statistical computations and draw conclusions from them
	+ An ability to communicate statistical results
	+ An understanding of how statistical concepts are commonly employed and understood by contemporary research psychologists
* Confidence to critically evaluate scientific research reported in academic publications and popular news and media outlets
* The ability to think about everyday problems analytically

**Course Requirements**

***Prerequisites***

PSCH 242 and ENGL 161 with a minimum grade of C; MATH 118 (or equivalent) with a minimum grade of C or MATH 090; or instructor consent. For psychology and neuroscience majors only. Students must register for both the lecture and discussion section. It is your responsibility to make sure you are eligible to enroll in this course.

***Required Text and Materials***

Aron, A., Coups, E. J., & Aron, E. N. (2013). *Statistics for psychology* (6th ed.). Boston, MA: Pearson.

Copies of this book should be available at the UIC bookstore and online. I have also put it on reserve at the UIC Library. Please contact me immediately if you have trouble locating a copy. Throughout the semester, other supplementary materials may be needed in addition to the textbook readings. These materials will be provided for you via the Blackboard website.

Please make sure that you also have a **scientific calculator**. You should be able to buy one for less than $10 on Amazon or in most drugstores. Bring it to class every day. You only need one that can do basic math: adding/subtracting/multiplying/dividing, squares/square roots, etc. Although I do not mind if you use a graphing or cellphone calculator during regular lecture and discussion meetings, you must use a basic scientific calculator on exams (i.e., no graphing or cellphone calculators).

**Course Format**

Lectures (T/Th) will cover new material, and discussion sections (F) will reinforce topics learned that week. In lectures, you will learn via PowerPoint presentations, as well as in-class practice problems and small group discussions. In discussion sections, you will have a chance to practice what you learned that week, primarily by completing group exercises. You are expected to come to class meetings ready to learn. This includes: (a) reading the assigned book chapters before you come to class, (b) attending every class meeting, and (c) putting forth your best effort during in-class exercises.

**Grading**

Course grades will be based on exams (60%), quizzes (5%), homework assignments (25%), and attendance (10%).

***Exams* (60%)**

There will be four exams (including the final) offered during the course of the semester. Good news! You are only required to take two of the first three exams. The best two of your first three exams will count toward your final grade (each will be worth 20% of your final grade). I implement this policy because I understand that life happens. For example, if you oversleep, are having a bad day, or are just not as prepared as you had hoped come test day, you can drop that exam. These first three exams are non-cumulative (but do be aware that they will build on earlier course sections and concepts).

The final exam is cumulative and will take place during finals week. The cumulative final is also worth 20% of your final grade. **NOTE:** The final exam is not included in the possible exams to be dropped. You must take the cumulative final.

Exam Format & Preparing for Exams:In the exams, you will be asked to solve problems and explain your results (you will be provided with a formula sheet for every exam). To do well on these kinds of exams, I do not recommend cramming the night before. The best way to do well is by putting in consistent effort during the duration of the semester. I recommend that you regularly come to class, keep up with readings, complete all homework, and come to my office hours for help working through the course material. If you need help preparing for exams (or on homework or anything else in the class) let me know. Remember: It is my job to help you succeed in this course! You may also find it useful to take advantage of your textbook’s supplementary study materials (MyStatLab) while preparing for exams (practice problem sets, practice quizzes, online tutorials).

***Quizzes* (5%)**

There will be six unannounced, in-class quizzes covering recently discussed material. The quizzes will be closed-book and closed-notes. Although this may sound daunting, it is actually a good thing: The quizzes will give you several opportunities besides major exams to identify strengths and weaknesses in your understanding of course material. You may drop your lowest quiz grade (i.e., each of your top five quiz grades will be worth 1% of your total grade).

***Homework Assignments* (25%)**

There will be nine homework assignments. These are designed to help you assess your knowledge about a particular topic and receive feedback on your work. You may drop your lowest homework assignment grade. This policy is in place just in case you miss a homework assignment or do not do as well as you had hoped on an assignment. In total, your eight highest homework grades will account for 25% of your final grade (i.e., each of your top eight homework assignments will account for approximately 3% of your final grade).

Homework assignments will be posted on Blackboard at least one week before they are due. Homework assignments will then be collected during the class meeting in which they are due, or they can be turned into my mailbox in BSB 1009 before class with a time stamp and secretary signature (for your own privacy, please put your homework in an envelope so others cannot see it). Please turn in hard copies of your assignments so I can give you written feedback. If you cannot make it to campus to turn in a hard copy of your assignment, you may turn in an electronic copy of your homework via e-mail by the beginning of the class meeting on which it is due (but please do not make a habit of this, because it will mean that you are missing class meetings!).

Late policy: I will allow you one “wiggle room” day, where you can turn in one homework assignment one day late *without penalty*. The due date when you take a “wiggle room” day is 24 hours after the original due date (i.e., due date is Saturday by 10am for an assignment originally due Friday at 10am). Additional late assignments will receive a deduction of 10% per day that the homework is overdue (e.g., if you turn in a homework assignment three hours after the deadline, the highest grade you could receive is a 90%; if you turn in homework 25 hours after the deadline, your max grade would be an 80%; etc.). Homework is considered late after it is collected in class.

***Class Attendance* (10%)**

Because attending class is the most fundamental step in learning difficult material, attendance will be worth 10% of your final grade. I will be taking attendance at each class meeting (both lectures & discussion) via a sign-in attendance sheet. You will receive full credit for signing in, and a zero for not signing in. It is your responsibility to make sure you remember to sign in each class meeting. Please note that if you come late to class you are still welcome to sign in; I encourage you to come to class even if you are running late because of unforeseen circumstances, but do not make a habit of it.

***Grade Breakdown***

|  |  |
| --- | --- |
| Exams (lowest of Exams 1-3 dropped) | 60% |
| Quizzes (lowest dropped) | 5% |
| Homework (lowest dropped) | 25% |
| Attendance | 10% |
| **Total** | **100%** |

Final grades will be on a standard 100-percentage scale: 90 – 100% = A; 80 – 89% = B; 70 – 79% = C; 60 – 69% = D; below 60% = F. **NOTE:** Normal mathematical rounding rules apply: e.g., 89.4 = 89 (B); 89.5 = 90 (A).

***Hypothetical Grade Calculation (A.K.A.: “How do I calculate my final grade?”)***

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

Homework score Exam score Quiz score

HW 1 100 Exam 1 75 Quiz 1 100

HW 2 90 Exam 2 82 Quiz 2 100

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

HW 4 60 Final Exam 79 Quiz 4 100

HW 5 92 ~~Quiz 5 50~~

~~HW 6 14~~ Quiz 6 90

HW 7 88

HW 8 70

HW 9 95 Attendance\* score

 Class 1 100

 Class 2 100

 Class 3 100

 Class 4 100

 Class 5 0

 Class 6 100

 Class 7 100

 Class 8 0

 Class 9 100

 Class 10 100

1. Sum your scores in each category.

Homework: 672 Exam: 236 Quizzes: 490 Attendance: 800

1. Divide your sums by the total number of assignments/exams/quizzes/classes, excluding the dropped assignment/exam/quiz.

Homework: 672/8 =84 Exam: 236/3 = 78.7 Quizzes: 490/5 = 98

 Attendance: 800/10 = 80

1. Weight the score in each category. Multiply the homework score by 0.25, the exam score by 0.60, the quiz score by 0.05, and the attendance score by 0.10. Then sum.

Final grade = 84(.25) + 78.7(.60) + 98(0.05) + 80(.10)

 = 21 + 47.22 + 4.9 + 8

 = 81.12

= **B**

\*Note that there will be more than 10 attendance grades this semester (closer to 45 total); for brevity, this hypothetical example only includes 10.

**Class Policies**

***Make-up Exam & Assignment Policy***

Make-up exams, quizzes, and assignments will be allowed only under unavoidable circumstances, like serious illness or family tragedy, on a case-by-case basis. Contact me right away if you unfortunately encounter a serious problem.

***Academic Integrity***

No form of cheating will be tolerated. If you cheat on any exam, quiz, or assignment in this class, you will fail the class and be subject to official judicial charges by the Dean of Students. There will be no exceptions.

Cheating includes (but is not limited to): looking at other people’s exams or letting them look at yours during an exam period, copying or giving others homework answers, and copying others’ written responses word-for-word on homework. You are allowed to check your answers on in-class activities or homework assignments with other students, but you must complete your work independently and check answers only after you have fully tried on your own. You should be writing your answers in your own words (e.g., interpretations of results, explanations of what statistical concepts mean). For more information about violating academic integrity and its consequences, consult the website of the UIC Office of the Dean of Students at <http://www.uic.edu/depts/dos/studentconduct.html>.

***Students with Disabilities***

UIC strives to ensure the accessibility of programs, classes, and services to students with disabilities. I care about helping you, too. Reasonable accommodations can be arranged for students with various types of documented disabilities. If you have questions or need help in obtaining access and accommodations, the *Office of Disability Services (ODS)* is available to assist students and work with me as instructor. Please contact at 312-413-2103 (voice) or 312-413-0123 (TTY).

***Getting Extra Help***

Throughout the semester, you may need help working through difficult material. Please set up a meeting with me to get extra help. The earlier you come in after being confused by something, the better: It is harder to catch up after being lost for several weeks. I want each and every one of you to succeed in this course, and I would be happy to provide any extra support that I can!!

Besides meeting with me, you can also take advantage of the services offered by the **Academic Center for Excellence**. The staff there can help you with reading, writing, study skills, and time management. Please contact them at 312-413-0031.

Finally, juggling all the responsibilities of being a college student can be difficult for anyone! I would encourage you to pursue **Counseling Services** at UIC. You can receive **free** and confidential services from the UIC Counseling Center (www.counseling.uic.edu). Please contact: 312-996-3490 or visit them in the Student Services Building at the corner of Harrison & Racine. Alternatively, the Counseling Center offers the InTouch Crisis Hotline for support, referrals, and telephone crisis interventions. Please contact: 312-996-5535 (6:00 p.m.-10:30 p.m.).

**Tentative Course Schedule**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Topic** | **Book Chapter** | **Assignments** |
| **Week 1** |  |  |  |
| Jan 10 | Course intro, Syllabus overview |  |   |
| Jan 12 | Research methods refresher, Intro to data displays | Intro; Chpt 1 |   |
| Jan 13 | Discussion section |  |  |
| **Week 2** |   |   |   |
| Jan 17 | Data displays; Measures of central tendency  | Chpt 1 |  |
| Jan 19 | Measures of central tendency (guest instructor) | Chpt 2 |   |
| Jan 20 | Discussion section (guest instructor) |  | HW 1 Due (1/20) |
| **Week 3** |   |   |   |
| Jan 24 | Variability  | Chpt 2 |  |
| Jan 26 | *Z*-scores, the normal curve, sampling, probability | Chpt 3 |   |
| Jan 27 | Discussion section |   | HW 2 Due (1/27) |
| **Week 4** |   |   |   |
| Jan 31 | Exam 1 review | Review Chpt 1-3 |  |
| Feb 2 | **Exam 1** |  |   |
| Feb 3 | NO DISCUSSION |   |   |
| **Week 5** |   |   |   |
| Feb 7 | Introduction to hypothesis testing | Chpt 4 |   |
| Feb 9 | *Z* tests | Chpt 5 |   |
| Feb 10 | Discussion section |   |  |
| **Week 6** |   |   |   |
| Feb 14 | Decision errors, effect size, power | Chpt 6 |   |
| Feb 16 | Catch-up day |  |   |
| Feb 17 | Discussion section |  | HW 3 Due (2/17) |
| **Week 7** |   |   |   |
| Feb 21 | Exam 2 Review | Review Chpt 4-6 |  |
| Feb 23 | **Exam 2** |  |  |
| Feb 24 | NO DISCUSSION |  |  |
| **Week 8** |   |   |   |
| Feb 28 | Single sample *t* tests | Chpt 7 |   |
| Mar 2 | Dependent means *t* tests | Chpt 7 |   |
| Mar 3 | Discussion section |  | HW 4 Due (3/3) |

**Tentative Course Schedule, cont.**

|  |  |  |  |
| --- | --- | --- | --- |
|   | **Topic** | **Book Chapter** | **Assignments** |
| **Week 9** |   |   |   |
| Mar 7  | Independent means *t* tests | Chpt 8 |  |
| Mar 9 | Catch-up day |  |   |
| Mar 10 | Discussion section |   | HW 5 Due (3/10) |
| **Week 10** |   |   |   |
| Mar 14 | One-way ANOVA | Chpt 9  |  |
| Mar 16 | One-way ANOVA, cont’d | Chpt 9  |   |
| Mar 17 | Discussion section |   | HW 6 Due (3/17) |
|  | **SPRING BREAK** |   |   |
| Mar 21  | **No class ☺**  |   |   |
| Mar 23 | **No class ☺** |   |   |
| Mar 24 | **No class ☺** |   |   |
| **Week 11** |   |   |   |
| Mar 28 | Factorial ANOVA  | Chpt 10 |  |
| Mar 30 | Factorial ANOVA, cont’d  | Chpt 10 |   |
| Mar 31 | Discussion section |   | HW 7 Due (3/31) |
| **Week 12** |   |   |   |
| Apr 4 | Exam 3 review  | Review Chpt 7-10 |  |
| Apr 6 | **Exam 3** |  |   |
| Apr 7 | NO DISCUSSION |   |  |
| **Week 13** |   |   |   |
| Apr 11 | Correlation | Chpt 11 |   |
| Apr 13 | Modeling; Parameter estimation | Chpt 12 |   |
| Apr 14 | Discussion section |   |  |
| **Week 14** |   |   |   |
| Apr 18 | Evaluating model fit; Model comparison | Chpt 12 |   |
| Apr 20 | Catch-up day  |  |   |
| Apr 21 | Discussion section |   |  HW 8 Due (4/21) |
| **Week 15** |   |   |   |
| Apr 25 | Intro to SPSS | Review Chpt 1-12 |   |
| Apr 27 | Final exam review |  |   |
| Apr 28 | Discussion section |  | HW 9 Due (4/28) |
| **Final Exam**May 1-5 | **TBA** |   |   |