PSCH 343
Statistical Methods in Behavioral Science
Spring 2021
Course Syllabus
CRN 27528 (4 Credit Hours)

Instructor:
Edward Sargis, Ph.D.
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Office: 1018C BSB
Office Hours: By appointment. I will typically be available to meet with students during our regularly scheduled class time. Outside of class time, because I am only able to meet via Zoom or Blackboard Collaborate, I have much greater availability than I normally would. Please **DO NOT HESITATE** to make an appointment with me if my regular office hours do not work.

Teaching Assistants:
Kathleen Hudson | khudso4@uic.edu
Greeshma Job | gjob2@uic.edu
Amber Singh | asing32@uic.edu

Lecture: 2 – 3:15PM T Th

See Timetable for discussion section days and times.

Prerequisites: PSCH 242 and ENGL 161 with a minimum grade of C; MATH 118 (or the equivalent) with a minimum grade of C or MATH 090; or consent of the instructor. For psychology and neuroscience majors only.

Students who do not have prerequisites will be dropped from the course.

Note: All references to time are Central Standard Time (CST). With the exception of exams, assignments are due by the end of day (i.e., 11:59PM CST) on the day of the week they are due.

Online Course Information

Course Structure
This is an entirely online course that will be held asynchronously. Lecture materials will be made available in video form as narrated PowerPoints. PowerPoint slides will also be made available to facilitate note taking.

Discussion sections will also be held asynchronously. Each week we will distribute problems based on the week's materials. We will also develop a mechanism in which interested students can connect with fellow students so that they may work on these problems in pairs and small groups.

Course Communication
Blackboard will serve as the communication hub for the course. Each week I will send an email via Blackboard with information about the week's activities. The information in these emails can also be found in the "Weekly Content" area of Blackboard for the corresponding week. In the weekly message, I will indicate and provide links to the lectures you are responsible for viewing that week. I will also remind you of any activities and assignments

due for the week (more information below). Finally, I will include any special announcements. It is your responsibility to read these weekly messages to stay informed about the course material.

Student Collaboration and Academic Integrity
I do not mind if students work together in parallel on <u>homework assignments</u> or <u>discussion activities</u>. Appropriate examples of collaboration include working together on a discussion section assignment or consulting another student on how to do a homework problem. On these types of assignments, you should always do your own work, but it would be permissible to check your answer with a fellow student or ask a question. If there was a discrepancy in an answer, both students should check their work and discuss where something might have gone wrong with a computation or interpretation of a result. **Under no circumstances should one student simply give an answer to another student to copy. Should this happen BOTH STUDENTS would fail the course** (see below for more information on student disciplinary procedures).

Under no circumstances are students allowed to work together in any way on an exam (see below for information on exams). Any students deemed to have worked together, even in a seemingly minor way, will immediately fail the exam and the course (See below for further information about student disciplinary procedures).

Technology Requirements
For the most part, the technology needs of the course are basic. Coursework can be completed on a basic laptop or tablet with an internet connection. For turning in assignments with written work, you may also choose to use a smartphone with a camera to scan your work.

Please contact UIC Technology Solutions (https://accc.uic.edu/) to request and borrow a laptop or be assigned a hotspot for the semester if you do not have the required hardware and internet capabilities.

General Course Overview

Overview
This is an introductory course in statistics that is designed for students majoring in Psychology and Neuroscience. The primary goal of the course is to develop your understanding of the ways in which mathematics and statistics are used to deepen our understanding of psychological phenomena. To accomplish this goal, we will work to develop your conceptual understanding of statistics. People often believe that learning statistics entails performing rigorous hand calculations. However, that is not the focus of this course. This is not to say that you will not perform calculations by hand. Rather, this course is designed to help you understand what the terms within various formulae mean, how various statistics are calculated, and how to interpret the results of statistical analyses. More important than calculating the correct numerical answer to a statistics problem is your understanding of what that number means, both in general terms and with respect to the research question you are attempting to address. We will also work to strengthen your confidence in your ability to understand statistics in published articles (both research articles as well as those you encounter in newspapers, on television, etc.), and in your ability to determine the kinds of statistical analyses that are appropriate for different kinds of data and research questions.

Course Learning Objectives

We will learn several statistical techniques over the course of the semester. For each statistical technique, you will learn:
- what the statistic can tell us about our data.
- the conceptual foundations of the statistics (i.e., how does it capture the characteristic of the data we are interested in?).
- how the statistic is computed.
- what a calculated statistic tells us about our data (i.e., how do we interpret the statistic we calculated?).
- what the statistic implies about the research question we are trying to answer (i.e., what are the larger implications of the statistic for the research?).

After taking this course, you will be able to:
- differentiate the different statistics we will discuss.
- select the appropriate statistical analysis to best evaluate a research question.
- interpret the results of basic statistical analyses.

Finally, you will develop foundational knowledge that will prepare you to learn more advanced statistical techniques used in the field**.**

Suggested Text

I do not require a text for this course. In the distant past I used to require "Statistics for the Behavioral and Social Sciences" by Aron and Aron (now Aron, Coups, and Aron). However, I found that I do not fully utilize it and I therefore do not require students to purchase the text. With that said, if you would like a book that will reinforce the concepts we will talk about, I recommend the Aron, Coups, and Aron book. There are many editions of the text. I think that any edition of that text would work. There are other statistics books out there, many of them are good, however other books might cover the material differently than I (or Aron, Coups, and Aron) cover it, so they could cause more confusion than they alleviate. With all this said, the vast majority of students do fine in the course without a book.

Course Assessments

Weekly Progress Assessments
Each week you will complete a brief "quiz" that will be administered via Blackboard. Quizzes will cover the material from each week's lectures. You may complete them open notes. These activities are meant to serve as a self-check on your knowledge of the week's material.

These quizzes will be posted to the "Weekly Content" area of Blackboard under the corresponding week. They will need to be completed by midnight Sunday at the end of each week the lecture material is assigned. They will be scored within blackboard so that you know how you performed. However, at the end of the semester, you will receive credit for simply completing these assessments. Your score for this unit at the end of the semester will be based on the percentage of these assessments that you complete. In other words, if you complete all the assessments, even if you did not do well on a few (or more!) of them, you will receive 100% for this portion of your grade. I will also allow you to miss one of these assessments without penalty.

Discussion Section Exercises
Each week, unless otherwise noted in the syllabus or in the weekly announcement, you will complete an activity that will give you experience computing the various statistics we will cover during the semester. These activities will be made available on Wednesdays and need to be completed by midnight the following Monday they are assigned. The exercises will be graded pass/fail based on whether you completed the full activity or not (i.e., no partial credit). You may miss one Discussion Section Exercise without penalty.

You will submit a copy of your discussion section exercises via Blackboard. The submission link for each week can be found in the corresponding folder for the week in the "Weekly Content" area of Blackboard.

Homework
A total of 7 homework assignment will be offered over the course of the semester. Homework will be due on the dates outlined in the syllabus. Your lowest of the seven homework grades will be dropped.

Keep two things in mind when doing the homework:

1. Be sure to show all your work for each problem that requires written calculations. Do not simply report your final answer. If your final answer is incorrect it may still be possible to earn partial credit if some parts of the

problem were done correctly. This is possible, however, only if you have shown all of your intermediate steps.
2. Neatness counts. If your work is illegible, crammed together, or so disorganized that it cannot be followed step by step in a logical sequence it will be difficult to assign partial credit.

Late Policy for Assignments

It is your responsibility to turn in your work on time. However, I also know that sometimes problems come up that prevent you from turning in an assignment by the deadline. For the three types of assessments discussed above (Weekly Progress, Discussion Section Exercises, and Homeworks), I will allow you to turn in one of each of them up to 48 hours late regardless of reason. Beyond this, I will not accept any late work (again, regardless of the reason). So, to summarize, you may miss one Homework, one Weekly Progress Assessment, and one Discussion Section Exercise. You also get to turn in one of each of those assignments up to 48 hours late. Beyond this, anything late or missing cannot be made up for credit. Note: This only applies to assignments in the class. Late exams will not be accepted under any circumstances.

Exams

Four exams will be offered: three exams during the semester and a final exam. Your lowest grade of the four will be dropped. The tests will be worth 60% of your final grade. Exams will be administered on the dates in the schedule below. They will be made available by 10am CST on the day of the exam and need to be submitted by 10pm CST the same day. While the exam window is 12 hours, the exams will be structured so that they can be completed within a 75 minute window (the length of a typical lecture period). I give you a large window so that you have some flexibility on when you work on the exam. You can take more than 75 minutes if you need to, and you can also start the exam and come back to it later as long as you submit it by the 10pm CST deadline.

Exams offered during the semester will be non-cumulative with the caveat that each section of the course builds on previous sections. Though I will not explicitly test you on concepts from an earlier unit, you will have to draw on knowledge from previous units on later exams. A cumulative final exam will be offered during the week of finals. You have the option <u>not</u> to take the final if you are satisfied with your scores on your first three exams.

As mentioned above, the lowest of the four exams will be dropped. The primary reason one exam will be dropped is that it eliminates the need for make-up exams. **Make-up exams will be given under only under extremely limited circumstances. The only exceptions are where university policy has precedent over my syllabus policy (e.g., religious holidays, military service, disability accommodations). Any make-up exam will be a different length and format than that administered during the regular exam window.**

You may use your notes during the exams. However, under no circumstances may you consult another student or anyone else regarding the exam. See below for additional information on student disciplinary procedures. **Students found cheating on an exam, whether by providing or receiving answers from another, will immediately fail the course.**

Course Grading

Course grades will be based on Weekly Progress Assessments (10%), Discussion Section Activities (10%) Homework (20%) and Exams (60%). Grades will be based on the following scale:

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

To estimate your grade during the semester, you can use the following formula:

(0.10 * Weekly Progress Assessment Completion %) + (0.10 * Discussion Section Activity Completion %) + (0.20 * Homework Average) + (0.60 * Exam Average)

Additional Notes

Academic Integrity

I designed this course to be as student-friendly as possible and I believe getting a good grade in the class is very achievable. The exams are open-notes and the drop policy typically helps students who might underperform on an exam. Additionally, several components of the course (e.g., Weekly Progress Assessments and Lab Section Activities) include points that are guaranteed as long as you complete the work. I want you to be successful in the course and I believe that you will be successful if you put in the work. In fairness to those students who are working hard to get the course material, any student found to be cheating in the class, no matter how minor of an offense, will fail the course. This includes anyone providing answers to another student. In all cases I will file a complaint against you with the Dean of Students, who will place a notice about the incident in your student file. There will be no exceptions to this policy.

Cheating includes but is not limited to copying or giving others test answers, or copying another students work on a homework assignment. Note that cheating often involves least two students. To be clear, any student who is a party to academic dishonesty will be subject to the penalties outlined above.

Please see the following for additional information about academic dishonesty and student disciplinary procedures.

https://dos.uic.edu/wp-content/uploads/sites/262/2020/01/DOS_Student-Disciplinary-Policy-2020.pdf

Emails
I do my best to respond to student emails in a timely manner. I read every email I receive, but sometimes I am unable to respond to students as quickly as I would like. If I do not respond to an email question within 48 hours, please resend me your email.

It will 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 your TA by Monday of finals week.

Disability Accommodations
The University of Illinois at Chicago is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at UIC. Students with disabilities who require accommodations for access to and/or participation in this course are welcome, but must be registered with the Disability Resource Center (DRC). You may contact DRC at 312-413-2183 (v) or 773-649-4535 (VP/Relay) and consult the following:
http://drc.uic.edu/guide-to-accommodations.

Course Communication Guidelines (Netiquette)
Netiquette is a set of rules for behaving properly online. Much of our communication in this course will take place in the forums and through email. Here are some guidelines for online communication in this course:

- Be sensitive to different cultural and linguistic backgrounds, as well as different political and religious beliefs.

- Use good taste when composing your responses. Swearing and profanity should be avoided. Also consider that slang terms can be misunderstood or misinterpreted.

- Don't use all capital letters when composing your responses. This can be considered "shouting" on the

Internet and is regarded as impolite or aggressive. It can also be stressful on the eye when trying to read your message.

- Be respectful of others' views and opinions. Avoid "flaming" (publicly attacking or insulting) others.

- Be careful when using acronyms. If you use an acronym it is best to spell out its meaning first, then put the acronym in parentheses afterward, for example: Frequently Asked Questions (FAQs). After that you can use the acronym freely throughout your message.

- Use good grammar and spelling, and avoid using text messaging shortcuts.

- In emails, always identify yourself and what class and section you are in. It is a good practice to put your course and section in the subject line. This helps your instructor identify course related emails.

Religious Holidays: Students who wish to observe their religious holidays must notify me by the tenth day of the semester they will be absent unless their religious holiday is observed on or before the tenth day. In such cases, the student shall notify me at least five days in advance of the date when he or she will be absent.

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.

Note that you will be graded according to the grading criteria listed above. **Please do not ask to be bumped up to the next highest grade at the end of the semester** (e.g., ask me for a C in the course when you have a 67.7% in the course). I will not do this. The number one factor that puts students in this situation is missed assignments and quizzes. I am unable to make exceptions for one student that I am not able to make for others in the class.

With this said, **if you have any problems or concerns throughout the class, please come see us during our office hours, before it is too late at the end of the semester.** I and the TAs are 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 our office hours.

Tentative course topics schedule

The following page contains a listing of topics. I fully intend to stick with this schedule, but it is your responsibility to keep track of any changes that might occur throughout the semester. **Note:** The dates listed correspond to the <u>Monday</u> of each week.

Week #	Date Week Begins	Lecture Topic
1	1/11	Introduction Quantification and Scales of Measurement No Discussion Section Exercise Week 1
2	1/18	Graphic Display of Data Central tendency
3	1/25	Variability Z-Scores Homework 1 Due Friday, January 29
4	2/1	Quantifying the Association Between Variables: Covariance Quantifying the Association Between Variables: Correlation Homework 2 Due Friday, February 5
5	2/8	Catch-up/Review EXAM 1 – Thursday, February 11 Homework 3 Due Friday, February 12 No Discussion Section Exercise Week 5
6	2/15	Introduction to Statistical Modeling Estimating parameters of simple linear models
7	2/22	Evaluating model fit: R-squared Evaluating Model Fit: Comparing Mathematical Models
8	3/1	Explaining Residual Variance: Errors in models and errors in measurement precision Sampling error: An intuitive exploration of the problem Homework 4 Due Friday, March 5
9	3/8	Catch/up Review EXAM 2 – Thursday, March 11 No Discussion Section Exercise Week 9
10	3/15	Quantifying sampling error: The standard error of the mean Null hypothesis significance testing: Using sampling distributions to make decisions about sampling error
SB	3/22	Spring Break
11	3/29	Null hypothesis significance tests: One Sample and Dependent Means t-tests
12	4/5	Null hypothesis significance tests: Independent Means t-tests (cont.) Null hypothesis significance tests: ANOVA Homework 5 Due Friday April 9
13	4/12	A Conceptual Introduction to Factorial ANOVA Null hypothesis significance tests: Chi-Square Homework 6 Friday April 16
14	4/19	Statistical power & effect size Homework 7 Due Friday, April 23 No Discussion Section Exercise Week 14
15	4/26	**EXAM 3 – Tuesday, April 27** No Discussion Section Exercise Week 15
Final Exams	---	FINAL EXAM – Date TBA