

CPSY 4010: Introductory Statistics for Clinicians

Fall 2020

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Office hours: By appointment
Class meetings: Online, asynchronous
Optional lab: Tuesday, 2:00 – 3:00, Room 133

Teaching Assistants: Haleh Kanani
Office hours: By appointment
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Required Text
none

Purpose

The purpose of this class is to teach you introductory statistics that will make you better consumers of statistical information in your professional careers and everyday lives. This class will focus on the *concepts* underlying statistics, not simply the symbolic representations of those concepts. We will not be simply using a stats “cookbook” but will instead discuss the hows and whys of statistical reasoning, so that you will understand how statistics can be used in your professional careers. After taking this class you will be familiar with descriptive and inferential statistics, hypothesis testing, common statistical procedures used in research, SPSS, and the strengths and weaknesses of various statistical strategies.

Course Structure

The class will be made up of asynchronous lectures, an optional lab, and discussion. Grades will consist of homework assignments and class participation.

All course content will be available asynchronously on Canvas. Topics are provided in weekly modules and comprise several separate videos. All homework assignments will be able to be completed by watching the videos and replicating examples provided in the videos on your own paper. Although the course will be entirely self-paced (you can move through the class in fewer than 10 weeks, if you choose), I encourage you to pace yourself according to the weekly modules.

Homework assignments are available at any time on Canvas. They are posted in each week’s module. Homework is due at the beginning of class the following Wednesday after it is distributed. For example, Week 1 homework is posted in the Week 1 module, and is due by Wednesday at 11:59 pm, Sept 23. That will give you an opportunity to ask questions about that week’s material in the optional lab before homework is due.

I will host an optional weekly lab in-person in Ammi Hyde 133. The lab will typically be held from 2:00 – 3:00, though some weeks may run longer. In the lab, I will work through example problems on the large whiteboard in the classroom. I will also answer any questions you might have about any topic up to that week's topic. However, I will not lecture; lectures are provided asynchronously on Canvas. The lab will be simulcast on Zoom, with the camera focused on the whiteboard during examples. I will also post a copy of the lab examples on the Canvas page so you can follow along if you're joining remotely.

The lab is entirely optional. You do not need to attend the lab in order to receive a high grade in the class. You should attend the lab if you have questions about the material or if you'd like to work through some additional examples. Essentially, if you have a special interest in stats, or if you're confused about that week's material, you should consider attending the lab.

Due to the limited in-person seating capacity in room 133 (19 people), we will ask you to request to attend in advance. If we get more than 19 people interested in attending in person, we'll draw names at random for the first lab; if we get more than 19 requests again, we will prioritize those that were not chosen for the first lab and then randomly choose the remaining students. We'll repeat that process each week that we receive more than 19 requests.

Grades

Grades will be determined by the following requirements:

Homework	90%
Class participation	10%

Homework: Each of the nine homework assignments will be worth a total of 10 points. Homework will be submitted through Canvas, either by completing the homework assignment within Canvas or by uploading photos or scans of your homework to Canvas. Homework is due by midnight on the following week's Wednesday (homework 2 is due by 11:59 pm on Wed, Sept 30). Of course, given the asynchronous nature of the course, you can submit homework early. Keys for homework will be uploaded weekly so that you can compare your homework (once graded and returned) to them.

Class participation: Class participation will be measured by attending a brief meeting with me once during the fall quarter. The meeting can occur via Zoom or in-person. For those meeting in-person, we'll meet at an easy hiking trail about 3 miles south of campus. Your grade will not vary based on which type of meeting you choose. Meetings will last for 15 minutes and we will use the time to discuss your goals for the quarter, your goals for the program, and how statistics might be applicable to both. Sign-up sheets and directions to the parking lot for the hiking trail will be posted on Canvas soon.

Attending the meeting and participating in the discussion will merit full credit for your class participation component. However, you can lose class participation points if you are disruptive, rude, or distracting at any time during the course.

There will be no extra credit, curving, or make-up assignments. Grades will be distributed as follows (please note there is *no* A+ or D):

93-100= A	80-82= B-
90-92= A-	77-79= C+
87-89= B+	73-76= C
83-86= B	70-72= C-
69 or less= F	

All other work is expected to be completed independently unless otherwise directed. DU and the GSSP have a strict honor code that promotes honesty and prohibits cheating in or out of class. DU's honor code can be found at: <http://www.du.edu/ccs/code.html>

Course Objectives

This course will address several major learning goals identified by the American Psychological Association through the attainment of multiple student learning outcomes (SLOs). Generally, you will understand how statistics are used in research methods by evaluating research studies, their conclusions, and the statistics used to support research claims. You will learn to choose and apply the correct statistical approaches for various types of situations. You will also learn to use appropriate computer-based applications to run statistical analyses. Finally, we will discuss career planning and development, with

the understanding that all graduate training and all career options in psychology rest partially on your facility with statistics.

Specifically,

1. Students will understand the difference between descriptive and inferential statistics, scales of measurement, types of variables, the nature of probability, and the categories of quantitative research questions (i.e., group differences vs. correlational questions).
2. Students will be familiar with the nature of various types of distributions.
3. Students will understand the role of the normal distribution in hypothesis testing.
4. Students will understand the nature of inferential decision making, including selecting the desired value for α and formulating hypotheses.
5. Students will be familiar with effect size, degrees of freedom, and power issues and how they influence statistical decision-making.
6. Students will be able to explain the role of standard error in statistical inference.
7. Students will understand statistical assumptions and violations thereof.
8. Given a research question, students will be able to identify the most appropriate statistical procedure for answering it.

A note on “keeping up”: Learning is a cumulative process in a statistics class.

Therefore, it is critical that you fully understand each week’s material before moving on to the next. In other words, your grasp of new material is predicated on your understanding of the previous week’s material. If you find yourself falling behind in your learning, schedule a meeting with me or Haleh (your TA). We are happy to help and, while we truly want students to take responsibility for their learning, we also want you to succeed and will support you in doing so. I know that statistics is rarely, if ever, a psychology student’s favorite class. But, since you are required to take it, why not make the best of the situation and embrace the challenge? We are here to help.

Please note that while this is not a math-heavy class, the use of a basic calculator will be required.

A note on cheating. As graduate students, I’m sure you are aware that there are dire consequences to cheating in class – consequences you probably are not prepared to face at this stage of your education. There is one simple way to avoid the problems associated with cheating: Don’t do it. For more information, please see

<http://www.du.edu/ccs/code.html>

Research Center Services

The University Libraries Research Center (<http://libraryhelp.du.edu>) answers research questions seven days a week by phone, email, in-person, chat/IM or text. One-on-one research consultations in the Anderson Academic Commons (AAC) are also available on a drop-in basis or by appointment. Consultations help students at any stage of the research process, from refining a topic, to finding books and articles, to creating a bibliography. The Research Center can also assist students with finding images, audio recordings, and videos for course projects. Telephone and Zoom video consultations are also available by request for distance students. Ask a question or make an appointment by calling 303-871-2905 or visiting <http://libraryhelp.du.edu>. Over 99% of the students who have visited the Research Center report they would recommend the Research Center to a friend or classmate. Computer support is available from the [University Technology Support \(UTS\) Help Center](#) located in the AAC. GSPP works closely with AAC Social Sciences Librarian, Jenny Bowers. Her email is jennifer.bowers@du.edu.

Religious Accommodations Policy

University policy grants students excused absences from class or other organized activities or observance of religious holy days, unless the accommodation would create an undue hardship. You must notify me by the end of the first week of classes if you have any conflicts that may require an absence. It is your responsibility to make arrangements with me in advance to make up any missed work or in-class material.

Inclusive Learning Environments

([developed by the Faculty Senate](#))

In this class, we will work together to develop a learning community that is inclusive and respectful. Our diversity may be reflected by differences in race, culture, age, religion, sexual orientation, socioeconomic background, and myriad other social identities and life experiences. The goal of inclusiveness, in a diverse community, encourages and appreciates expressions of different ideas, opinions, and beliefs, so that conversations and interactions that could potentially be divisive turn instead into opportunities for intellectual and personal enrichment.

A dedication to inclusiveness requires respecting what others say, their right to say it, and the thoughtful consideration of others' communication. Both speaking up and listening are valuable tools for furthering thoughtful, enlightening dialogue. Respecting one another's individual differences is critical in transforming a collection of diverse individuals into an inclusive, collaborative and excellent learning community. Our core commitment shapes our core expectation for behavior inside and outside of the classroom.

Mental Health & Wellness

As part of the University's Culture of Care & Support we provide campus resources to create access for you to maintain your safety, health, and well-being. We understand that as a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug concerns, depression, difficulty concentrating and/or lack of motivation. These stressful moments can impact academic performance or reduce your ability to engage. The University offers services to assist you with addressing these or ANY other concerns you may be experiencing. If you or someone you know are suffering from any challenges, you should reach out for support. You can seek confidential mental health services available on campus in the Health & Counseling Center (HCC). **If you seek services at the DU HCC, please be aware that you will be ineligible to accept a field placement or internship at that site due to the potential for problematic dual relationships. A list of psychotherapists is available under the Pioneer Web GSPP tab, in the Student Resources folder.** Another helpful resource is Student Outreach & Support (SOS), where staff work with you to connect to all the appropriate campus resources (there are many!), develop a plan of action, and guide you in navigating challenging situations. If you are concerned about one of your peers you can submit a report through our Pioneers Care System. More information about HCC, SOS, and Pioneers CARE can be found at:

Health & Counseling Services (<http://www.du.edu/health-and-counseling-center/>)

Student Outreach & Support and Pioneers Care reporting
(<http://www.du.edu/studentlife/studentsupport/>)

Title IX

Gender violence can happen to anyone regardless of race, class, age, appearance, gender identity, or sexual orientation. The University of Denver is committed to providing an environment free of discrimination on the basis of sex (gender), including sexual misconduct, sexual assault, relationship violence, and stalking. [The Center for Advocacy, Prevention and Empowerment \(CAPE\)](#) provides programs and resources to help promote healthy relationships, teach non-violence and equality, and foster a respectful and safe environment for all members of the University of Denver community. All services are confidential and free of charge.

For assistance during business hours, call 303-871-3853 and ask to speak to the Director of CAPE. After hours, please call the Emergency & Crisis Dispatch Line at 303-871-3000 and ask to speak to the CAPE advocate on call. For more information, please visit the Office of Equal Opportunity & Title IX website at <https://www.du.edu/equalopportunity/titleix/>.

Statement about Professional Writing

GSPP students are encouraged to take advantage of the Writing Center's services; discussing writing practices and texts benefits writers at all levels of education and confidence. The Center offers individual consultations and small-group workshops that address everything from generating ideas and navigating new genres to crafting strong sentences and documenting sources. In fall 2020, all consultations and workshops will be

offered online via Zoom. For more information, including instructions on how to make appointments, prepare for consultations, and access writing and citation resources, visit <https://portfolio.du.edu/writingcenter>.

Research Center Services

At this time, the University Libraries Research Center (<http://libraryhelp.du.edu>) will be maintaining services virtually through chat and email during our regular hours. Please contact us through chat or email for the quickest response time. All research consultations will be offered virtually through Zoom. Consultations help students at any stage of the research process, from refining a topic, to finding books and articles, to creating a bibliography. The Research Center can also assist students with finding images, audio recordings, and videos for course projects. Over 99% of the students who have visited the Research Center report they would recommend the Research Center to a friend or classmate. Please check the [Libraries' COVID-19 page](#) for up-to-date information on our libraries' services such as [access to our physical collections, due date extensions, and restrictions on ILL and Prospector](#). Computer support is available from the [University Technology Support \(UTS\) Help Center](#). GSPP works closely with AAC Social Sciences Librarian, Jenny Bowers. Her email is jennifer.bowers@du.edu.

Information about Academic Integrity

Please examine the University of Denver's Honor Code, Code of Student Conduct, and Student Rights and Responsibilities documents, which are posted on the website of DU's Office of Citizenship and Community Standards (<http://www.du.edu/studentlife/studentconduct/index.html>). All members of the University community, including students, faculty, staff, administrators and trustees, are entrusted with the responsibility of observing these ethical goals and values as they relate to academic integrity and must not commit any intentional misrepresentation or deception in academic or professional matters.

GSPP Resources

If you have questions or concerns at any time during your training here at the GSPP, you may speak with any professor; your advisor; another faculty member, staff member, or administrator you trust; Dorothy Hansen, Psy.D., the GSPP Student Advocate (at 303.756.3002 or dorothyhansen6@gmail.com).

Profession-wide Competencies to Prepare for Practice in Health Service Psychology

In this class, students are being prepared to demonstrate practice in Health Service Psychology as outlined in these areas:

- 1) Research
- 2) Ethical and legal standards
- 3) Individual and cultural diversity
- 4) Professional values, attitudes, and behaviors
- 5) Communication and interpersonal skills
- 6) Assessment
- 7) Intervention
- 8) Supervision
- 9) Consultation and interprofessional/interdisciplinary skills

Restriction of Audio or Visual Recording, Reproduction, and Distribution of Content in Online Courses

At the University of Denver, we protect the intellectual property of all our faculty, and safeguard the privacy of all our students in online learning environments. To this end, students may not record, reproduce, screenshot, photograph, or distribute any video, audio, or visual content from their online courses. This restriction includes but is not limited to:

- Pre-recorded and live lectures
- Live discussions
- Discussion boards
- Simulations
- Posted course materials
- Faculty feedback forms
- Visual materials that accompany lectures/discussions, such as slides
- Virtual whiteboard notes/equations, etc.

As we engage in online learning as an academic community, it is imperative to be respectful of all. Keep in mind that if any student is identifiable in an online class recording, this may constitute a violation of the educational record protections provided under FERPA.

Students with disabilities who need to record classroom lectures or discussions must contact the Disability Services Program to register, request, and be approved for an accommodation. All students are advised that students may tape classroom activities for this purpose. Such recordings are to be used solely for individual or group study with other students enrolled in the class that quarter/semester. They may not be reproduced, shared in any way (including electronically or posting in any web environment) with those not in the class in that quarter.

Students who violate this policy will be reported to The Office of Student Rights & Responsibilities and may be subject to both legal sanctions for violations of copyright law and disciplinary action under *Student Rights & Responsibilities Policies*.

Students with Disabilities, Medical or Mental Health Conditions

Students who have disabilities, medical or mental health conditions wanting to request accommodations should contact the **Disability Services Program** (DSP). Information is also available online at the [DSP website](#) or see the [DSP Handbook](#). Students wishing to request COVID-19 related adjustments can find information about the request process by visiting the [COVID-19 Requests](#) page on the DSP website or by contact DSP at; 303.871.3241; 1999 E. Evans Ave.; Suite 440 Ruffatto Hall.

Schedule

This is a tentative schedule of classes. All homework is due by 11:59pm on Wednesday of the week following that topic.

- Week one: Sept 15
Introduction to statistics
Populations vs. samples; random sampling
Descriptive vs inferential statistics
Levels of measurement/organization of data
Measures of central tendency: mode, median, and mean
- Week two: Sept 22
Homework 1 due Sept 23
Measures of variability: variance and standard deviation
Introduction to normal curve: Standard scores (z-scores)
- Week three: Sept 29
Homework 2 due Sept 30
Probability rules
Sampling, standard error of measurement
- Week four: Oct 6
Homework 3 due Oct 7
Null hypothesis, significance levels
Type I and Type II errors
- Week five: Oct 13
Homework 4 due Oct 14
The t distribution
Differences between means (t-test), sample tests of proportion
- Week six: Oct 20
Homework 5 due Oct 21
Intro to effect size and power analysis
Confidence intervals

- Week seven: Oct 27
Homework 6 due Oct 28
Logic of ANOVA, sum of squares, multiple comparison of means, F ratio
- Week eight: Nov 3
Homework 7 due Nov 4
Correlation, Pearson's r
- Week nine: Nov 10
Homework 8 due Nov 11
Regression, comparisons to ANOVA and correlation
- Week ten: Nov 17
Homework 9 due Nov 18
Chi square, non-parametric statistics
Choosing your statistics