PSY 420M – Advanced Data Analysis and Methods for the Behavioral Sciences

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Syllabus – Fall 2025

Important note: The first **seven** pages of this syllabus (pages 1 through 7) will be covered as part of the first quiz, so make sure you read and understand everything!

Overview

PSY 420M is a **hybrid** course, combining online, asynchronous course content (see "Course materials", below), with mandatory weekly in-person lab sessions. Your final grade will be determined by your performance on mandatory weekly labs, periodic quizzes, and a collection of Case Study assignments.

The weekly labs are short exercises in analyzing data and interpreting the findings. For each lab, you will write up a short report and submit it as your "exit ticket" from lab.

(_Face-to-Face sections only_) The weekly lectures allow you to take a deep dive into the week's statistical topic, by re-introducing you to the topic, having you work in groups on a few practice problems, and then interact with the instructor as they review the problems in class.

The quizzes evaluate your basic knowledge of the course content. There will be 4 quizzes during the semester, and an optional final quiz during finals week. Your final quiz grade will be based on the highest 4 of the 5 possible grades.

The Case Studies will allow you to put what you are learning in the lectures and labs into practice. Each case study will ask you to consider a real-world data science problem, and your job will be to produce a short report that answers the scientific question of interest.

Both the dates for the quizzes and the due dates for the case studies are posted on the Canvas calendar, and they are also visible in the "Assignments" and "Syllabus" links in the left sidebar on Canvas.

Case Study assignments should be **submitted on time because the late penalties are substantial** (1.5% per hour – thus, after 3 days late, these assignments are worth 0 points), so submit them when they are due!

The quizzes

There are 4 required quizzes during the semester, each of which will cover several topics in statistics and data analysis (the first quiz also covers pages 1-7 on this syllabus!). They will be available to start for a 24-hour period, so there should be no scheduling conflicts. (Note that, once you start the quiz, there **is a time limit** as indicated in the instructions for each quiz.) Alternate testing times for athletes or students with disabilities must be scheduled ahead of time through the Athletics Department or the Disabilities and Access office, respectively.

There is also an **optional fifth quiz** covering the whole course that will be available during finals week. Your final grade will reflect your 4 highest quiz grades; thus, if you take all 5 quizzes, your lowest quiz grade will get dropped. If you miss a quiz for any non-approved excuse, the final quiz will serve as your make-up quiz.

Quizzes are open notes, but must be completed on your own -- you may not collaborate with anyone else on quizzes. Collaboration on quizzes is a violation of UT's Honor Code , and may result in dismissal from The University.

The Lectures (_Face-to-Face sections only_)

Each weekly "lecture" is actually only part lecture, and in reality consists of three short sections:

1. A presentation of the week's statistical topic (10-15 mins) – _the lecture_

2. The assignment of several practice problems, which you will solve using paper, pencil, and a calculator, with your group (15 mins) – *the solving of the practice problems*

3. Interaction with the instructor as they review the practice problem solutions on the whiteboard – *the solutions*

The Labs

The weekly, in-person labs are short exercises in data science. **Attendance is mandatory.** For each lab, your TA will go over the data and required analysis, including a description of the "*deliverables*" – these are defined as whatever it is you need to submit to get credit for the lab. For the remainder of the lab, you will work on the lab assignment, and the TA will circulate, and help you out. You can also help each other! But the work you turn in must be your own, of course. Again, you should try your best not to miss any labs, as the information you learn in one lab is relevant to other labs. Data science is cumulative. Makes sense, right?

The labs are graded on a 10-point scale. You will be docked points for missing or incorrect items. *All lab assignments will be due at the end of your lab period, submitted in Canvas as a PDF document, and you will receive a zero for any missed lab.* Your lowest 2 lab grades will be dropped (so in theory, you can miss 2 labs without a penalty to your grade, but you should try your very best not to miss any labs). If you need to or want to miss a lab, there is no reason to contact us – it will count as one of your drops. Use your "lab drops" wisely! If you really need to miss a lab late in the semester, but have already used your drops, you will have to take the zero as part of your grade!

Note: you must be present during lab section to receive lab assignment credit. **Absentee submissions will not be accepted.**

The Case Studies

Every few weeks we will release three new case studies, and *you must pick one of these to complete by the next deadline.* Your job is to emulate a data science consultant who is tasked with answering a scientific question using the data provided, conveying the results to a broad audience. By the end of the semester you will have completed four case study assignments, one from each batch. The case studies will increase in complexity as the semester progresses, covering various aspects of psychological data science ranging from descriptive analysis to regression modeling. At the end of the semester, you will put these case studies together to form your *data science portfolio*.

Teaching Assistants

Your TA is your primary point of contact for this course! In addition to running the weekly labs, they will grade everything you turn in. TAs cannot give extensions to assignment deadlines – please contact your professor if you are experiencing an interruption to your studies that requires grace.

Office Hours and Communication

We strongly encourage you to attend office hours regularly! During office hours with your TA, you can discuss the course material, ask questions about grading, and get help with your case studies. **But don't forget about your professor!** They have weekly office hours too, and this is your main way to get to know them and benefit from their knowledge and experience!

Check Canvas to find the times and locations of office hours. Outside of office hours, please *direct all lab-related electronic communication to your TA via Canvas Messages*. If you deem it vital to contact your professor outside of office hours, <u>make sure to cc your TA on the message</u>.

Canvas Calendar

Quiz dates and assignment due dates are posted on the Canvas Calendar. Any due date changes will be accompanied by an announcement and a Canvas Calendar update. You can see these deadlines on the "Assignments" and "Syllabus" links in the left sidebar of Canvas.

Course materials

All course files (e.g., lecture videos, notes, tutorials, practice problems) can be found online, in your Canvas Modules. These are the *asynchronous* materials that would be presented during in-person lectures, in a traditional, in-person course. This hybrid course uses the much more effective *flipped classroom* model, in which you learn and practice the course materials at your convenience, attend lecture to review and test your proficiency (for Face-to-Face sections only), and attend your professor's regularly scheduled office hours to ask questions, discuss issues and concerns, etc.

All the material for a given week will be posted on Monday. Don't be overwhelmed if it seems like a lot of stuff! You have all week to do it, and the labs are always based on the previous week's material, not the current one. We post all the material on Mondays to allow you to manage your time most effectively during the week given other demands on your time.

Other modules such as practice problems on the content will be posted just below the weekly content.

Attendance and Absences

Regular and punctual attendance is required in the weekly lab. **If anything unexpected happens that prevents you from completing any of your coursework you should immediately contact Student Emergency Services, which can assist and help communicate with your professors**. Please be prepared to provide them with appropriate documentation, such as a note from a medical professional. Then contact your professor to discuss any possible accommodations.

Religious Holidays. Students are excused from attending lab and lecture for the observance of a religious holy day, including travel for that purpose and will be allowed to make up missed work, and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time. If you must miss class for a religious observance, please notify your instructor at the beginning of the semester, or, failing that, as early as possible.

Official UT Activities. Students are also excused for travel relating to official UT activities such as athletics or band. Please let your instructor know at the beginning of the semester if this applies to you. Generally, we also get notified by the head/director/coach, but we rely on you to give us the exact dates so we can work out accommodations.

Excessive absences (whether excused or not) or improper conduct in the classroom may result, at the discretion of the instructor, in consequences that include: a reduced letter grade, dropping the student from the course (with the resulting grade of "Q"), assignment of a failing grade for the course, or other appropriate sanctions. If you stop attending class but fail to drop the course officially, a grade of "F" is recorded for the course. An incomplete grade – meaning that you can make up the work during the following semester – is given at the sole discretion of your professor, and only under extreme circumstances.

Academic Q-Drop Policy

If you want to drop a class after the 12th class day, you'll need to execute a Q-drop before the deadline, which typically occurs near the middle of the semester. Under Texas law, you are only allowed six Q-drops while you are in college at any public Texas institution. For more information, see: https://onestop.utexas.edu/registration-and-degree-planning/registering-for-classes/add-drop-a-course/academic-q-drops/

Course Requirements

Pre-requisites for the course
- Restricted to Psychology majors
- Requires M 302 or higher-level math in addition to PSY 301
- Students cannot enroll in PSY 420M a second time without written permission from a departmental advisor
- Students may **not** enroll in PSY 420M a third time

Required Materials

You will need a computer, hopefully of relatively recent vintage. Please bring your computer to lab!

Please install recent versions of **R and RStudio** on your computer. Both are free. Install R from https://cran.r-project.org/ and then RStudio from https://posit.co/download/rstudio-desktop/ (pick the free, open-source edition).

If you have any trouble at all installing R and RStudio on your machine (e.g., outdated hardware, or using a tablet or Chromebook) you can use RStudio Cloud (https://posit.cloud/plans/free). This usually works right out of the box. If you run into problems, please contact LAITS (https://liberalarts.utexas.edu/laits/services/computer-support/index.php) for further help.

Install the app "**Probability Distributions**" by Matt Bognar on your phone. It is free, and available for both iOS and Android. Access it at https://stat.uiowa.edu/people/matthew-bognar

You will need a program that can 1) embed images into documents and 2) export documents as PDF files. Word (Microsoft), Pages (Apple), and Docs (Google) all work well for this.

Optional but handy: a spreadsheet program that you can use to view and edit data files (mainly .csv files). Excel (Microsoft) and Sheets (Google) both work well.

As a UT student, Microsoft Office is free to you at https://it.utexas.edu/services/software-applications.

Responsibilities and Expectations

It is your responsibility to watch the videos, read any notes provided, etc. in a timely manner to keep pace with the course. You are expected to watch/read the assignment descriptions and contact your TA or instructor with any questions well in advance of the due dates.

Grading for this Course

Your final grade for this course will be determined by your scores on the 4 highest quizzes, the lab assignments (after dropping your lowest 2 scores), and the 4 Case Studies.

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Course grades will be determined as follows:

40%	Quizzes (10% each)
20%	Lab assignments
40%	Case studies (10% each)

All instructions, assignments, readings, data sets, and essential information will be on Canvas. **Check Canvas regularly.**

There is a Canvas mobile app (for both Android and iOS) that does notifications, so "I didn't see that on Canvas" is absolutely never a valid excuse.

Academic Integrity

Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and / or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information, please visit the Student Conduct and Academic Integrity website at: http://deanofstudents.utexas.edu/conduct.

Sharing of Course Materials is Prohibited

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class unless you have the professor's explicit, written permission. Unauthorized sharing of materials promotes cheating. It is a violation of the University's Student Honor Code and an act of academic dishonesty. This professor is aware of the sites used for sharing materials, and any materials found online that are associated with you, or any suspected unauthorized sharing of materials, will be reported to Student Conduct and Academic Integrity in the Office of the Dean of Students. These reports can result in sanctions, including failure in the course.

Class recordings are reserved only for students in this class for educational purposes and are protected under FERPA. The recordings should not be shared outside the class in any form. Violation of this restriction by a student could lead to Student Misconduct proceedings.

Finally, PLEASE DO NOT post screenshots of correct answers on websites or in group chats. This violates the academic honesty agreement. It's also just not cool.

Each student in the course is expected to abide by the University of Texas Honor Code: "As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity." **Plagiarism is taken very seriously at UT.** Therefore, if you use words or ideas that are not your own (or that you have used in previous class), you must cite your sources. Otherwise, you will be guilty of plagiarism and subject to academic disciplinary action, including failure of the course. You are responsible for understanding UT's Academic Honesty and the University Honor Code which can be found at the following web address: https://deanofstudents.utexas.edu/conduct/standardsofconduct.php. The use of any AI-generated work for any submission (e.g. text, code, etc.) is considered plagiarism and will be subject to the same penalties (note: AI prose is starkly different in style for the writing of college students!). If you are retaking this class, you must produce new, original, submissions – you may not recycle any of your previous submissions.

However, it is legitimate and acceptable to use AI tools to help you better understand statistical concepts and research methods as a backup method for instructions in R-studio. *It is critical, however, to realize that AI*

programs are not always correct!

Canvas automatically generates a Turnitin score for you. A Turnitin score is the percentage of a paper's text that matches existing sources in Turnitin's database, indicating potential overlap or plagiarism. If you submit something with a Turnitin score of over 25% you will have to resubmit the assignment and receive

- A warning with no penalty the first time.

- 50% grade penalty the second time.

- A zero for assignment the third and any subsequent times.

Grading Policy

Final grades will be assigned according to the UT Liberal Arts undergraduate plus/minus grading scale.

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93-100	90-<93	87-<90	83-<87	80-<83	77-<80	73-<77	70-<73	67-<70	63-<67	60-<63	0-<60

Important: Your letter grades are computed automatically in Canvas. Canvas does not round, so a 92.99 is, unfortunately, an A-. To get an A, your number grade must be a 93.00 or higher. ***We cannot entertain any requests at the end of the semester to get your grade across a threshold.*** **This includes requests to regrade, round up, get extra credit, re-do an assignment, etc.** **If you contact us with such a request, we will not respond.**

Late Submissions

Late submissions on Case Studies are penalized at 1.5% per hour late. The hour is rounded up, so if an assignment is due at 11:59pm, and you submit it at midnight, that counts as an hour late. **No late submissions are accepted for quizzes or labs.** Deadlines may be extended only in the case of a legitimate and *documented* emergency (that is, an emergency that is communicated to us through student emergency services https://deanofstudents.utexas.edu/emergency/).

Quizzes: ***Quizzes must be finished and submitted by the end of the 24-hour quiz window***. Once you start the quiz, you will have the allotted time to complete the quiz, or the time until the quiz window closes, whichever is shorter. For example, if it is a 30-minute quiz, make sure that you start at least 30 minutes prior to the end of the window, if you want to be able to use the full time. *No late submissions are allowed, and the grade will be zero if the quiz isn't submitted during the 24-hour window*.

🔥**Do not play with fire! If you have a Case Study that is due at 11:59pm, don't start the submission process at 11:55pm. We recommend that you begin submission at least 30 minutes before the deadline. You might have computer problems or whatnot, but that is on you. *Manage your time and get everything submitted well before the deadline!***

What will I learn?

How do we figure out what is true about the world around us? For situations that are simple and obvious, we can use one or more of our five senses (for example, if you wanted to know which is louder, an alarm clock or a smoke detector). However, for many phenomena, *the way to arrive at the truth is to collect good data and analyze them appropriately*. In this course, we will learn how to collect good data, and how to use these data to reach sensible conclusions about the world.

PSY 420M covers three foundational areas:

1. data visualization and analysis
2. the communication of data-based findings (in the form of Case Study reports)
3. the formulation and testing of scientific hypotheses

Learning Outcomes

1. Ability to assess, explore, and analyze data
2. Skills to communicate data and findings effectively
3. Ability to formulate and answer scientific questions

Student Rights & Responsibilities
- You have a right to a learning environment that supports mental and physical wellness.
- You have a right to respect.
- You have a right to be assessed and graded fairly.
- You have a right to freedom of opinion and expression.
- You have a right to privacy and confidentiality.
- You have a right to meaningful and equal participation, to self-organize groups to improve your learning environment.
- You have a right to learn in an environment that is welcoming to all people. No student shall be isolated, excluded or diminished in any way.

With these rights come responsibilities:
- You are responsible for taking care of yourself, managing your time, and communicating with the teaching team and with others if things start to feel out of control or overwhelming.
- You are responsible for acting in a way that is worthy of respect and always respectful of others.
- You are responsible for creating an inclusive environment and for speaking up when someone is excluded.
- You are responsible for holding yourself accountable to these standards and holding each other to these standards.

University Resources for Students

Disabilities and Access
> This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, or if you require special accommodations to succeed in this class (e.g., extra time on quizzes), please let us know! To do this, you need to obtain a letter that documents your need for accommodation from the Disability and Access office (https://community.utexas.edu/disability/). Do this as soon as possible. This office will then contact your professor who can then work with you to create a plan for support. Please use this resource if you need it!

Counseling and Mental Health Center
> Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.
>
> All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.
>
> If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support. http://www.cmhc.utexas.edu/individualcounseling.html

The Sanger Learning Center
> Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas. For more information, please visit http://www.utexas.edu/ugs/slc or call 512-471-3614 (JES A332).

Undergraduate Writing Center: http://uwc.utexas.edu/
Libraries: http://www.lib.utexas.edu/
Information Technology: https://ut.service-now.com/ *Student Emergency Services*:
http://deanofstudents.utexas.edu/emergency/

BeVocal
> BeVocal is a university-wide initiative to promote the idea that individual Longhorns have the power to prevent high-risk behavior and harm. At UT Austin all Longhorns have the power to intervene and reduce harm. To learn more about BeVocal and how you can help to build a culture of care on campus, go to: https://www.healthyhorns.utexas.edu/lwc/bevocal.html..

Important Safety Information:
> If you have concerns about the safety or behavior of fellow students, TAs or Professors, call BCAL (the Behavior Concerns Advice Line): 512-232-5050. Your call can be anonymous. If something doesn't feel right – it probably isn't. Trust your instincts and share your concerns.
>
> The following recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767, http://www.utexas.edu/safety/
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> Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a

fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.
    - In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.
- Link to information regarding emergency evacuation routes and emergency procedures can be found at:
    www.utexas.edu/emergency

Title IX Reporting

Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, sexual misconduct, dating/domestic violence and stalking at federally funded educational institutions. UT Austin is committed to fostering a learning and working environment free from discrimination in all its forms. When sexual misconduct occurs in our community, the university can:

1. Intervene to prevent harmful behavior from continuing or escalating.
2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX investigation.
3. Investigate and discipline violations of the university's relevant policies.

Faculty members and certain staff members are considered "Responsible Employees" or "Mandatory Reporters", which means that they are required to report violations of Title IX to the Title IX Coordinator. **I am a Responsible Employee and must report any Title IX related incidents** that are disclosed in writing, discussion, or one-on-one. Before talking with me, or with any faculty or staff member about a Title IX related incident, be sure to ask whether they are a responsible employee. If you want to speak with someone for support or remedies without making an official report to the university, email advocate@austin.utexas.edu For more information about reporting options and resources, visit titleix.utexas.edu or contact the Title IX Office at titleix@austin.utexas.edu.