SDS s302
Data Analysis for the Health Sciences

Summer 2020

COURSE DESCRIPTION

From the course catalog: "Basic probability and data analysis for the sciences. Subjects include randomness, sampling, distributions, probability models, inference, regression, and nonlinear curve fitting."

This course is designed to help you learn the basics of data analysis, including the descriptive and inferential statistical procedures that are commonly used in health science research.

EVAN OTT

Email: evan.ott@utexas.edu
Pronouns: he/him/his
Course Unique Number: 86271
Course Website:
utexas.instructure.com/courses/1281102
Any updates to the syllabus will published on the course website and announced.
Class: MTWHF 10-11:30am on Zoom
Office hours: after class or by appointment

This course may be used to fulfill the **mathematics** component of the university **core curriculum** and addresses the following three core objectives established by the Texas Higher Education Coordinating Board: communication skills, critical thinking skills, and empirical and quantitative skills. This course carries the Quantitative Reasoning flag and the Ethics flag.

Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

Ethics flag. Ethics courses are designed to equip you with skills that are necessary for making ethical decisions in your adult and professional life. You should therefore expect a substantial portion of your grade to come from assignments involving ethical issues and the process of applying ethical reasoning to real-life situations.
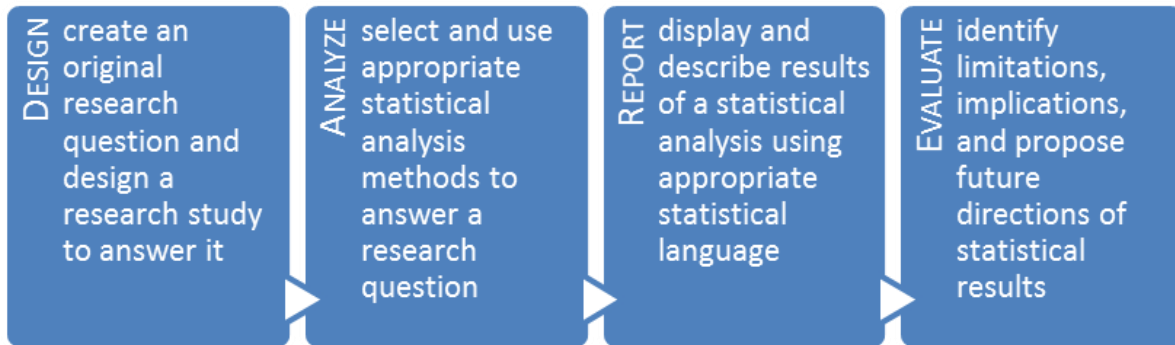
COURSE FORMAT: CLASS AND LAB

Class will meet Monday-Thursday on Zoom. You will learn from our video textbook (on Canvas) **before** coming to class, and during class we will review any troublesome material and work on more complex practice problems. The handouts that accompany the video textbook will simplify your note taking and problem-solving practice. Because class will be focused on interactive problem solving, you will be at a *tremendous disadvantage* if you fail to engage with the video textbook before class.

Every Friday, you will complete a lab assignment, analyzing real-world data in groups by the end of the day. Groups will meet on Zoom during the normal class time, however, if all group members agree, the group may find an alternate time and/or medium to collaborate. It is **mandatory** that the group work together. Students failing to work with their group will have points deducted from their grade.

WHAT ARE THE COURSE GOALS?

DESIGN	ANALYZE	REPORT	EVALUATE
create an original research question and design a research study to answer it	select and use appropriate statistical analysis methods to answer a research question	display and describe results of a statistical analysis using appropriate statistical language	identify limitations, implications, and propose future directions of statistical results

SKILLS THIS COURSE WILL DEVELOP

Critical Thinking. "Correlation does not imply causation."
Thoughtfully critique reported statistics in media, ask questions becoming of a statistician, consider ethical implications of researcher decisions. Question whether measured, concluded, and reported relationships between variables are appropriate and meaningful.

Mathematical Reasoning. "There's no such thing as a math person."
Manipulate equations, reason about behavior, formulate alternatives. Apply mathematical insights to real-world applications.

Group Collaborating. "We're all in this together."
Encourage growth and learning, communicate clearly and often, teach peers and learn from them. Walk humbly.

Problem Solving. "One step at a time."
Practice breaking down problems into manageable steps, identify key information, develop ability to match problem types to analysis methods. Start by writing what you know.

Question Asking. "Three other students had that question."
Identify knowledge gaps, press for clarification, seek deeper understanding. Build confidence for when it matters most.

Teach
Encourage
Review
Think Practice Train Study Reason
Communicate
Prepare Grow
Learn Ask
Work Question

Don't understand something in class?	• Raise your hand and ask a question or ask in the meeting chat!
Not sure how to solve a problem?	• Watch the hand calculation videos on the course page, review your notes, and go to office hours.
Can't figure out how to do something in Excel?	• Review the online videos in your pre-labs.
Practice, practice, practice!	• Work the practice problems and quizzes on Canvas and the extra problems from the handout.
Need motivation to study?	• Form a study group and work together weekly.

WHAT ARE THE COURSE REQUIREMENTS?

REQUIRED TEXTBOOK & MATERIALS

Note: there is no textbook to purchase for this course.

Software for Lab. Make sure you have access to Excel 2016 or 365 (no trial versions, not Excel Online or previous versions). Excel 365 is free as part of a Microsoft bundle available to all students for download. Remote access will be provided for students using tablets, Chromebooks, or older computers. Follow the directions on the document posted on Canvas.

Additional materials. You will need to register for a **Duo** account if you have not already. Class will be conducted on **Zoom**. We will use **Piazza** throughout the course as a question-and-answer forum – please sign up for an account through the course Canvas page. To submit some assignments, you will need a **scanner** or **camera** – for most students, I recommend the **Canvas Student** app by Instructure.

LECTURE ATTENDANCE & PARTICIPATION

There are 25 points assigned for lecture attendance and participation. You must be present and participate (via polls on Zoom) in at least 80% of the lecture days to receive 25 points. If you participate in at least 50% of classes (but less than 80%) you will get 10 points. Otherwise, you get 0 points.

ZOOM EXPECTATIONS & INFORMATION

When not actively asking or answering a question in the large group setting, please keep your microphone muted as to not disrupt others. To help me gauge your understanding, I would prefer that you turn on your video, but this will in no way be required. Classes will be recorded and made available within Canvas but will not be shared beyond our course. You may find it useful to have the handouts available (likely printed), as well as the formula sheet, statistical tables, and a calculator.

HOW WILL I LEARN COURSE MATERIAL?

Class (MTWTh)	Before Class	During Class	After Class
What you'll be doing	Intro + Examples	Review + Examples	Homework
Where you'll find it	Video textbook in a Canvas Discussion	Zoom	Canvas Assignment
Where to ask questions	Replies to Canvas Discussion	Full class discussion, breakout rooms, chat	Piazza, office hours
Lab (F)	Before Lab Day	During Lab Time**	During Lab Day**
What you'll be doing	Pre-Lab assignment	Lab Assignment	Lab Assignment
Who will do the assignment	Individual	Group	Group
Where you'll find it	Video/pdf tutorial and assignment	Canvas Assignment, Zoom	Canvas Assignment
Where to ask questions	Piazza, office hours	Breakout rooms, chat	Piazza

** As stated above, groups will meet during class time on Fridays by default but may set up an alternate time if all group members agree.

WHAT KINDS OF ASSIGNMENTS WILL WE DO?

This course is divided into three units. Each unit ends with an exam that will evaluate your knowledge of the material. All other unit assignments are learning tools designed to help you develop the necessary skills and understanding. There will be ample amounts of practice material provided through practice problems and exam reviews. You are encouraged to start practicing your skills early and repeat often. This is the best way to succeed on the exam. The poster project will be a project of your own design, which will evaluate all of the statistical skills you learned throughout the semester.

COURSE ORGANIZATION
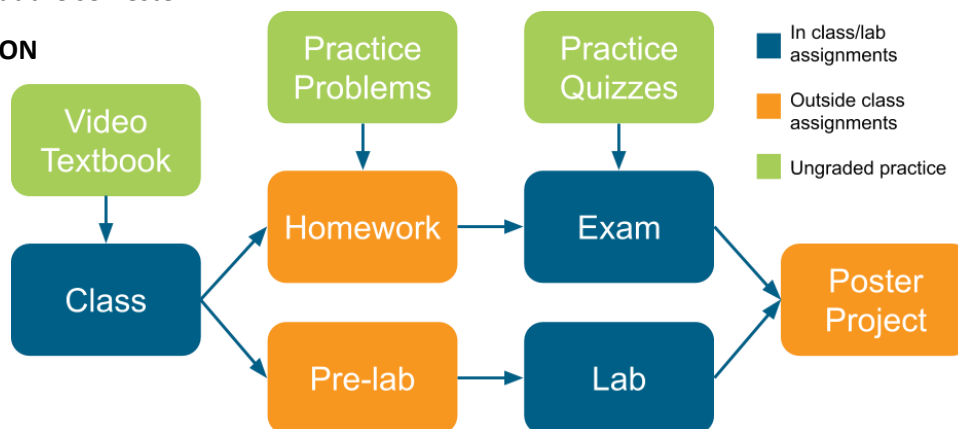
WEEKLY DEADLINES

Assignment	When is it due?
Pre-Lab	Thursdays, 11:59pm Austin time
Homework	Varies, 10am Austin time
Lab	Fridays, 11:59pm Austin time

ASSIGNMENT DESCRIPTIONS

5 Labs (45 pts each). Labs consist of two assignments: pre-lab and lab. Pre-lab is completed individually online and you can re-take it once for a higher grade. Lab is completed in groups, on Fridays. By default, groups will meet during the Friday class period, but by consensus may select another time to work together. You will use the skills learned during the pre-lab in the lab assignment. It is *incredibly important* you complete the pre-lab to ensure you have acquired the Excel skills you will use during the lab.

10 Homeworks (10 pts each). Homework problems will cover material from the video textbook and class. Homework must be submitted via Canvas by the deadline. You must photograph your handwritten work. For most students, I recommend submitting photos from a phone using the Canvas Student app by Instructure.

3 Exams (150 pts). There will be three in-class exams. These exams are a combination of multiple choice, true/false, and hand problem-solving. To prepare for the exams look through old homework problems, in class examples, practice problems, and complete the practice quizzes.

Poster Project (200 pts total). This project will allow you to select your own research question of interest, collect your own data, and present your findings. There will be several important deadlines throughout the semester leading up to the final poster.

Assignments	Points
Labs	225
Homework	100
Exams	450
Project	200
Attendance	25
Total	1000

HOW WILL I BE GRADED?

MISSED ASSIGNMENT POLICY I will offer make-up exams, assignments, and labs only under the following circumstances. For any other reason, a make-up is not guaranteed and a grade of "0" will be recorded for any missed lab, assignment, or exam.

1. You are unavailable due to a UT-sponsored activity including athletics. Check with me if you are uncertain whether your absence qualifies. You must notify me 1 week in advance to schedule a make-up lab.

2. The lab or exam is in conflict with a religious observance – notify me by the 4th day of class.

Attendance 2.5%
Project 20.0%
Labs 22.5%
Homework 10.0%
Exams 45.0%

3. You suffer from a chronic, documented illness or an emergency that results in your missing an exam or lab. Under these circumstances, contact me as soon as possible to discuss a course of action.

If you miss an assignment for any other reason (e.g., unexpected illness not documented, car wreck) you have 24 hours to contact me and discuss your course of action. **I allow each student to submit 1 late assignment without penalty, if you contact me within 24 hours of missing the deadline**. If you fail to contact me within this time frame you will not be allowed to make up missed assignments unless you have documentation indicating your inability to contact me. After your first late assignment, you will receive a grade of 0 on any missed or late lab or assignment unless you can provide documentation for one of the 3 reasons listed above.

If you experience a Canvas issue and cannot upload an assignment through the system before the deadline, if you email the assignment to me prior to the deadline, the assignment will not be considered late. Emailing to state you are experiencing a problem, without including the assignment as an attachment will still count as a missed assignment.

BONUS POINTS Occasionally, there will be assignments during the semester that I will offer as bonus points. These bonus points will be added to your overall TOTAL points for the class at the end of the semester.

REGRADE POLICY If you think there may be an error in grading, you should bring it to my attention. To request a regrade, send an email to me that does include the words "Regrade Request for SDS s302" in the subject heading. Include the unique number of the course or class and lab time, your name, EID, the exact assignment (e.g., HW 3), and a clear concise summary of the concern. If you do not provide evidence of a specific error, your request for a regrade will not proceed.

There will be a one-week window after you receive your grade for regrade requests on any course assignment. Then, the grade sticks.

FINAL COURSE GRADES Final grades will be assigned according to the grade point cutoffs listed here. Please note that grade cutoffs are firm. Grades will not be curved in this class. Keep track of your progress so you know if you are meeting your grade goal. Your total course grade will be reflected on Canvas. Your bonus points and attendance credit will be added in at the end of the semester.
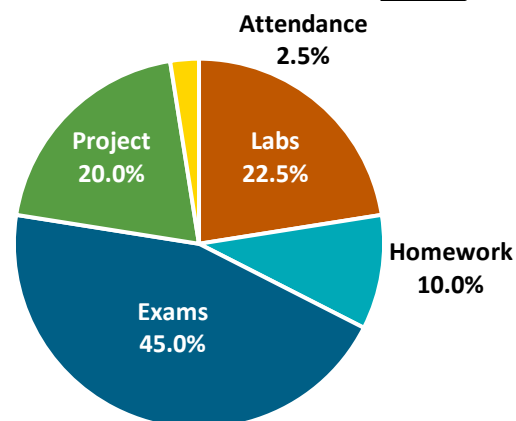
Course Grade	Points Needed
A	930
A -	900
B+	870
B	830
B -	800
C+	770
C	730
C -	700
D+	670
D	630
D-	600

SUMMER 2020 SCHEDULE

Monday	Tuesday	Wednesday	Thursday	Friday
July 13 Syllabus + Data	**July 14** Displaying Data + Describing Data	**July 15** Z-Scores HW 1 due	**July 16** Normal model Pre-lab due	**July 17** Boxplot Lab
July 20 Sampling Distributions + Estimating the Mean HW 2 due	**July 21** One-sample t-test + p-values	**July 22** Independent t-test HW 3 due	**July 23** Project intro + workshop HW 4, pre-lab due	**July 24** Independent t-test Lab
July 27 Exam 1	**July 28** Paired t-test + ANOVA Project Proposal due	**July 29** ANOVA post-hoc HW 5 due	**July 30** Chi-square GOF + Contingency Tables HW 6, pre-lab due	**July 31** ANOVA Lab
August 3 Chi-square Independence	**August 4** Scatterplots and correlation HW 7 due	**August 5** Basic Functions HW 8 due	**August 6** Exam 2 Pre-lab due	**August 7** Chi-squared Lab
August 10 Linear Regression Project Data + Descriptives due	**August 11** Linear Regression 2 + Exponential Models HW 9 due	**August 12** Logs and Exponents	**August 13** Project Workshop HW 10, pre-lab due	**August 14** Linear Regression Lab Final Project due

Exam 3: during final exam period either Saturday, August 15 or Monday, August 17 (not yet scheduled)

Note: any updates to the syllabus or schedule will be reflected on the course website and announced.

WHAT ARE OTHER RESOURCES AND POLICIES?

NOTE FROM EVAN Much of what follows is common to many (or even all) courses at UT. I have lightly edited the generic information for specific relevance to this fully online version of SDS s302. If you have any questions or concerns, or need help connecting to resources, please reach out to me, and I will do my best to help in any way I can.

ACADEMIC HONESTY The course is built upon the idea that team-based learning is important and a powerful way to learn. I encourage you to study together often. However, there are times when you need to demonstrate your own ability to work and solve problems. In particular, your projects and exams are independent assignments. This means these assignments are to be completed on your own, without discussion with your peers. You can work with other students to complete your homework, but you cannot copy answers from someone else. Students who violate these expectations can expect to receive a failing grade on the assignment and be reported to the Student Judicial Services for academic dishonesty. **If you have any questions or concerns about what is considered appropriate collaboration,** reach out to me and I would be happy to discuss it with you. Additionally, you cannot share any assignment, handout, or document related to this class. Sharing any class materials online in any form, including the homework and assignments you submitted, without my express approval is considered academic dishonesty. If something is found online which you have posted, you will be reported for academic dishonesty to SJS.

STUDENT ACCOMMODATIONS This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, if you have medical information that you need to share with me, or if you need specific arrangements, please let me know. **Please set up an appointment with me as soon as possible to discuss any accommodations. Also, please notify me as soon as possible if the material being presented in class is not accessible.** I am committed to creating an effective learning environment for all students, but I can only do so if you discuss your needs with me as early as possible. I promise to maintain the confidentiality of these discussions. Any student with a documented disability who requires academic accommodations should contact Services for Students with Disabilities at 512-471-6259 (voice) or 512-410-6644 (Video Phone) as soon as possible to request an official letter outlining authorized accommodations. For more information, visit http://ddce.utexas.edu/disability/about/.

IF YOU NEED HELP 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, I strongly encourage you to seek support. **CMHC Crisis Line** is a confidential service of CMHC that offers an opportunity for UT-Austin students to talk with trained counselors about urgent concerns. A counselor is available every day of the year, including holidays. You can call when you want, at your convenience. Telephone counselors will spend time addressing your immediate concerns. CMHC 24/7 Crisis Line: 512-471-CALL (2255). For other resources, consider visiting http://www.cmhc.utexas.edu/individualcounseling.html Finally, please remember that **Student Emergency Services** is ready to help you in the case of family emergencies, medical or mental health concerns, and much more: https://deanofstudents.utexas.edu/emergency/

IF SOMEONE ELSE NEEDS HELP 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 (the number is on your UT student ID). Your call can be anonymous. If something doesn't feel right–it probably isn't. Trust your instincts and share your concerns. Additionally, **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: wellnessnetwork.utexas.edu/BeVocal.

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.
- Your experience with this course is directly related to the quality of the energy that you bring to it, and your energy shapes the quality of your peers' experiences.
- 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, holding each other to these standards, and holding the teaching team accountable as well.

PERSONAL PRONOUN USE Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name, unless they have added a "preferred name" with the Gender and Sexuality Center (http://diversity.utexas.edu/genderandsexuality/publications-and-resources/). I will gladly honor your request to address you by a name that is different from what appears on the official roster, and by the gender pronouns you use (she/he/they/ze, etc.). Please advise me of any changes early in the semester so that I may make appropriate updates to my records.

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.

Beginning January 1, 2020, Texas Senate Bill 212 requires all employees of Texas universities, including faculty, report any information to the Title IX Office regarding sexual harassment, sexual assault, dating violence and stalking that is disclosed to them. Texas law requires that all employees who witness or receive any information of this type (including, but not limited to, writing assignments, class discussions, or one-on-one conversations) must be reported. **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 would like to speak with someone who can provide support or remedies without making an official report to the university, please email advocate@austin.utexas.edu. For more

information about reporting options and resources, visit http://www.titleix.utexas.edu/, contact the Title IX Office via email at titleix@austin.utexas.edu, or call 512-471-0419.