TEXAS
The University of Texas at Austin

INF 385T – Applied Experiments and Measurement

Unique number 27730
Spring 2024

Class Meets: 6-9PM, WEDNESDAYS, UTA 1.212

Instructor: Professor Anjali Oza
Pronouns: she/her/hers
Office hours: by appointment (15m) on Zoom https://utexas.zoom.us/my/anjalioza
Email: Use Canvas to email

COURSE DESCRIPTION

UNIVERSITY CATALOG COURSE DESCRIPTION

Explore hypothesis generation, design and set up of experiments (A/B tests), quasi-experimental methods (regression, matching, heterogeneous treatment effects, etc.), interpreting results and uncertainty, and communicating insights to various audiences; with a focus on impacting practical business and product decisions.

PRE-REQUISITES FOR THE COURSE

There are no prerequisites for this course other than graduate standing. Understanding statistics, including confidence intervals, p-values, and regression analysis, will help.

LEARNING OUTCOMES

By the end of the course, you will be able to:

1. Generate and prioritize hypotheses effectively
2. Design and set up experiments
3. Understand how to scale experiments and what's needed for an experimentation platform
4. Apply causal inference methods to different scenarios based on specific business needs and product lifecycle
5. Be able to critique and evaluate studies for common pitfalls such as selection bias and confounders
6. Define and select appropriate success metrics
7. Assess and communicate uncertainty, risks, and tradeoffs to inform decision-makers

HOW WILL YOU LEARN?

TEACHING MODALITY INFORMATION

This is an in-person course and class meetings will be held in-person throughout the semester unless an emergency arises requiring the class to be held over Zoom. There will be no alternative to in-person attendance,

other than normal emergency accommodations. Class will meet once a week, and will be half lecture and half hands on discussion. Your progress in the course will be evaluated through a combination of assignments, group exercises and presentation, and discussion.

COMMUNICATION

The course Canvas site can be found at utexas.instructure.com. Please email me through Canvas. You are responsible for ensuring that the primary email address you have recorded with the university is the one you will check for course communications because that is the email address that Canvas uses.

ASKING FOR HELP

I will hold office hours via Zoom (https://utexas.zoom.us/my/anjalioza) by 15m appointments. You can email me through Canvas to set up.

UNIVERSITY POLICIES AND RESOURCES

For a list of important university policies and helpful resources that you may need as you engage with and navigate your courses and the university, see the University Policies and Resources Students Canvas page. The page includes the language of the University Honor Code, Title IX legal requirements for Texas employees, and information about how to receive support through the office of Disability & Access.

COURSE REQUIREMENTS AND GRADING

REQUIRED MATERIALS

There are no textbooks that you are required to purchase for this course. Lectures will reference Causal Inference The Mixtape by Scott Cunningham, the full text of which is available for free online https://mixtape.scunning.com/

Class materials, supplemental resources, grades, and announcements will be posted on the course Canvas site https://utexas.instructure.com/courses/1380559

SHARING OF COURSE MATERIALS IS PROHIBITED

No materials used in this class, including, but not limited to, lecture hand-outs, videos, assessments (quizzes, exams, papers, projects, homework assignments), in-class materials, review sheets, and additional problem sets, may be shared online or with anyone outside of the class without my explicit, my written permission. Unauthorized sharing of materials may facilitate cheating. The University 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 initiation of the student conduct process and include charge(s) for academic misconduct, potentially resulting in sanctions, including a grade impact.

GETTING HELP WITH TECHNOLOGY

Students needing help with technology in this course should contact the ITS Service Desk

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CLASSROOM EXPECTATIONS

Class attendance I will take attendance each week, and your percentage of attendance will count for 10 percent of your grade.

Class participation Your meaningful engagement in class discussion will count for 10 percent of your grade.

Behavior expectations Guidelines and ground rules for appropriate behavior can be found in Section 11-400 of the Institutional Rules in the General Information Catalog.

Professional Standards You are expected to work individually and with others. Homework assignments are individual and the final presentation will be done in groups. Your performance as a team member (measured by peer evaluation) will count for 10% of your final grade.

CONTENT WARNING

Our classroom provides an open space for the critical and orderly exchange of ideas through discussion. Some readings and other content in this course will include topics and comments that some students may find offensive and/or traumatizing. I'll aim to forewarn students about potentially disturbing content and I ask all students to help to create an atmosphere of mutual respect and sensitivity.

ARTIFICIAL INTELLIGENCE

The creation of artificial intelligence tools for widespread use is an exciting innovation. These tools have both appropriate and inappropriate uses in classwork. The use of artificial intelligence tools (such as ChatGPT) in this class is strictly prohibited. This includes using AI to generate ideas, outline an approach, answer questions, solve problems, or create original language. All work in this course must be your own or created in group work, where allowed.

ASSIGNMENTS

The following table represents how you will demonstrate your learning and how we will assess the degree to which you have done so.

Assignments	Points Possible	Percent of Total Grade
1. Homework assignments (3 in total, 10 points each)	30	30%
2. Class attendance	10	10%
3. Class participation (including in-class activities)	10	10%
4. Final group presentation	40	40%
5. Peer evaluation for final presentation	10	10%

LATE WORK AND MAKING UP MISSED WORK

Late work is not accepted. There will not be makeup assignments for missed work.

ABSENCES

I will take attendance each week, and your percentage of attendance will count for 10 percent of your grade.

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RELIGIOUS HOLY DAYS

By UT Austin policy, you must notify me of your pending absence for a religious holy day as far in advance as possible of the date of observance. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

EXTRA CREDIT

There is no extra credit available in this class and grades are not rounded.

+/- GRADING POLICY

You will receive the grade with modifier corresponding to the score you achieve in this course (breakdown outlined in the table below).

GRADE BREAKS

Grade	Cutoff
A	94%
A-	90%
B+	87%
B	84%
B-	80%
C+	77%
C	74%
C-	70%
D+	67%
D	64%
D-	60%
F	<60%

ACADEMIC INTEGRITY EXPECTATIONS

Students who violate University rules on academic misconduct are subject to the student conduct process. A student found responsible for academic misconduct may be assigned both a status sanction and a grade impact for the course. The grade impact could range from a zero on the assignment in question up to a failing grade in the course. A status sanction can include a written warning, probation, deferred suspension or dismissal from the University. To learn more about academic integrity standards, tips for avoiding a potential academic misconduct violation, and the overall conduct process, please visit the Student Conduct and Academic Integrity website at: http://deanofstudents.utexas.edu/conduct.

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COURSE OUTLINE

All instructions, assignments, readings, rubrics and essential information will be on the Canvas website at https://utexas.instructure.com/courses/1380559. Check Canvas regularly. **Changes** to the schedule may be made at my discretion if circumstances require. I will announce any such changes in class and will also communicate them via a Canvas announcement. It is your responsibility to note these changes when announced, and I will do my best to ensure that you are notified of changes with as much advance notice as possible.

Week	Date	Day	Class Topic	Out of Class Activities	Assignments Due
1	1/17	W	Intro, Why measurement and experimentation matters, Generating Hypotheses, Metrics		
2	1/24	W	Stats Review (power, uncertainty, regression)	Causal Inference The Mixtape Ch. 2	Homework 1 (outcome 1) due Tuesday, 1/30 before 11:59pm
3	1/31	W	DAG, counterfactuals, ATE	Causal Inference The Mixtape Ch. 3, 4 *Optional reading: Imbens 2020*	
4	2/7	W	Experimentation framework, design, scaling, platform	*Optional reading: Trustworthy Online Controlled Experiments*	
5	2/14	W	Experimentation analysis and common pitfalls	*Optional reading: Trustworthy Online Controlled Experiments*	Homework 2 (outcomes 2, 3) due Tuesday, 2/20 before 11:59pm
6	2/21	W	Experimentation applications in tech		
7	2/28	W	Causal Inference Part I (difference-in-difference, matching)	Causal Inference The Mixtape Ch. 5, 8, 9	
8	3/6	W	Causal Inference Part II (regression discontinuity, instrumental variables)	Causal Inference The Mixtape Ch. 6, 7	Homework 3 (outcomes 4, 5) due Tuesday, 3/12 before 11:59pm
9	3/13	W	Causal Inference Part III (synthetic control, wrap-up)	Causal Inference The Mixtape Ch. 10	
10	3/20	W	ML-based approaches for measurement	Ascarza 2018	
11	3/27	W	Causal inference applications in tech		

Week	Date	Day	Class Topic	Out of Class Activities	Assignments Due
12	4/3	W	Communicating insights - explaining risks and uncertainty		In-class activity (outcomes 5, 6, 7)
13	4/10	W	Communicating insights - data storytelling	Optional reading: Persuading with Data by Mira Kazakoff	In-class activity (outcomes 6, 7)
14	4/17	W	Work in class on group presentations		
15	4/24	W	Final group presentations		Final group presentations (outcomes 1-7) due in class 4/24

COUNSELING AND MENTAL HEALTH CENTER (CMHC)

Students who are struggling for any reason and who believe that it might impact their performance in the course are urged to reach out to Bryce Moffett if they feel comfortable. This will allow her to provide any resources or accommodations that she can. If immediate mental health assistance is needed, call the Counseling and Mental Health Center (CMHC) at 512-471-3515 or you may also contact Bryce Moffett, LCSW (iSchool CARE counselor) at 512-232-4449. Bryce's office is located in FAC18S and she holds drop in Office Hours on Wednesday from 2-3pm. For urgent mental health concerns, please contact the CMHC 24/7 Crisis Line at 512-471-2255.

IMPORTANT SAFETY INFORMATION

CARRYING OF HANDGUNS ON CAMPUS

Students in this class should be aware of the following university policies related to Texas' Open Carry Law:

- Students in this class who hold a license to carry are asked to review the university policy regarding campus carry.
- Individuals who hold a license to carry are eligible to carry a concealed handgun on campus, including in most outdoor areas, buildings and spaces that are accessible to the public, and in classrooms.
- It is the responsibility of concealed-carry license holders to carry their handguns on or about their person at all times while on campus. Open carry is NOT permitted, meaning that a license holder may not carry a partially or wholly visible handgun on campus premises or on any university driveway, street, sidewalk or walkway, parking lot, parking garage, or other parking area.

ACCESSIBLE/COMPLIANT STATEMENT:

If you are a student with a disability, or think you may have a disability, and need accommodations please contact Disability and Access (D&A). You may refer to D&A's website for contact and more information: http://community.utexas.edu/disability/. If you are already registered with D&A, please deliver your Accommodation Letter to me as early as possible in the semester so we can discuss your approved accommodations.