The country is hungry for information; everything of a statistical character, or even a statistical appearance, is taken up with an eagerness that is almost pathetic; the community have not yet learned to be half skeptical and critical enough in respect to such statements. —JOHN GENERAL FRANCIS A. WALKER, SUPERINTENDENT OF THE 1870 CENSUS

OPRE 3360.0U1 SUMMER 2025 Syllabus

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Dr. Whalen's office is JSOM 3.420

During the summer, after each lecture in the classroom is a great time to bring me your questions and concerns! Alternatively, for office hours by appointment, email to request an in-person or virtual (live MS Teams chat) appointment, and we'll work out a time!

Dr. Whalen's email is tristan.whalen@utdallas.edu

Have a question from class? Stuck on a homework problem? Feeling lost in the material? Send me an email!

Please include your full elearning name, course number, AND section number in every email to me.

Please, no online templates or AI-generated essays. Keep it short and to the point. No need for pleasantries or formalities. Please avoid saying, "I hope this email finds you well." *Please, no messages to me in Teams or eLearning.* Email my UTD address directly from your UTD email.

From the UTD calendar

Mon. June 2 – classes start

Tue. June 17 – last day to drop (no record)

Thu. June 19 – no classes

Fri. July 4 – no classes (we will not have in-person class on July 7)

Thu. July 17 – last day to withdraw

Wed. August 13 – last day of classes

Class meetings Mondays and Wednesdays, 3:00pm to 5:00pm [Mon. June 2 to Wed. August 13, except for Mon. July 7] JSOM 1.110

In-class eLearning Test dates

Monday, June 23 – Test 1 (descriptive statistics, experiments and observational studies) Wednesday, July 16 – Test 2 (regression) Wednesday, August 13 – Test 3 (probability and statistical inference) Take the test in the classroom, on your laptop, in eLearning. Use Excel for calculations and "scratch work." Additional policies are described below.

Course materials

Required: Microsoft Excel, desktop version (not the online/cloud version).

Required: Laptop computer to bring to class on test days.

Optional: *Statistics*, by Freedman, Pisani, and Purves, 4th edition.

Optional: *Modern Business Statistics*, by Anderson, Sweeney, Williams, Camm, Cochran, Fry, and Ohlmann, 7th edition.

Coursebook description

This course focuses on the concept of probability and statistics for managerial decision making. Concepts will be developed in lectures and exercises using software packages and topics including summarizing and presenting data, probability theory, sampling, estimation, confidence intervals, hypothesis testing, regression, and ANOVA.

Topic List

#	Whalen Statistics Topic	Freedman	Anderson
01	Experiments and Observational Studies	Ch.01-02	1.3 (brief mention)
	RCTs, blinding, observational studies, confounding factors		
02	Shape, Center, and Spread	Ch.03-04	2.2, 3.1-3.2
	Histograms, the average of a list, the SD of a list,		,
	z-scores, empirical rule, medians		
03	Normal Approximation to Data	Ch.05	6.2
	Properties of normal curves, comparing to data		
	histograms, area calculations with software,		
	quantiles, skew, measurement error		
04	Analyzing Variance with Sums of Squares!	n/a	13.2
	Descriptive ANOVA: within-group, between-group,		(not recommended)
	and total sum of squares; coefficient of		
	determination; comparing one-average and		
	multiple-average summaries		
05	Scatterplots and Correlation	Ch.08-09	2.4, 3.5
	Comparing two numerical variables; constructing		
	the correlation coefficient, concepts about		
	correlation, correlation is not causation		
06	Regression Lines	Ch.10-12	14.2-14.3
	Computing and interpreting a regression line,		
	least-squares method, RMS-residual, coefficient of		
	determination as r-squared, beware of various		
	types of extrapolations, regression effect		
07	Multiple Regression	For residual plots, see	15.1-15.3, 15./-15.8
	Interpret a regression equation, least-squares	ch.11; for a brief but	
	method, RMIS-residual, coefficient of	helpful discussion of	
	determination, residual plots, polynomial	multiple regression,	
0	Probability from Pasies to Payes' Pula	See end of ch.12	A 1 A A
08	Probability: Irom Basics to Bayes Rule	CII.13-14	4.1-4.4
	independence, addition rule and mutual		
	evolusiveness, complement rule: conditional		
	nrohahility Rayes' rule		
٥N	Random Variables	Ch 15-16	5155
05	Prohability distributions and prohability	CII.13 10	J.1, J.J
	histoarams determining a distribution using		
	direct calculation using simulation and using		
	prefab templates (such as Binomial)		

10	Expected Value, Standard Error, and Normal Approximations to Probability Definition and mathematical properties of Expectation and SE; the Central Limit Theorem	Ch.17-18	5.3, 7.5-7.6
11	Statistical Inference	Ch.19-21	7.1-7.2, 7.7, 8.4
	History lessons about sampling, random sampling		
	model, confidence intervals for a proportion		
12	Confidence Intervals	Ch.23-24	8.1, 8.2
	Average of a random sample, z-intervals,		
	interpreting confidence levels, t-intervals		
13	Probability Tests	Ch.26, 29	9.3-9.4
	Basic probability tests, null hypothesis and chance		
	model, z-test, t-test		

ABOUT THE ORDER OF TOPICS

Lesson 01 establishes the difference between descriptive and inferential statistics. Lessons 02-07 are about descriptive statistics and apply practically to any data set.

- We couch analysis in terms of "lists of numbers" and do not distinguish between population and sample until after probability. In particular, we define the "SD of a list" to be the root-mean-square deviation from the average of the list. These are correct both mathematically and practically for descriptive statistics.
- We include ANOVA and regression before and without probability for theoretical, practical, and pedagogical reasons—
 - Theoretical: sums of squares and the least squares method (with all the related calculations) do not require any probability assumptions; it's just geometry and calculus. The corresponding tests, like t-tests and F-tests, usually do not apply, and often do not contribute any additional information anyway; these ideas are discussed in my notes.
 - Practical: regression can give useful insight into observational data and powerful descriptive summaries that have nothing to do with probability.
 - Pedagogical: there is plenty to cover in regression before getting bogged down with probability.
- We avoid worthless statements such as this one from the Anderson textbook: "Using only r^2 , we can draw no conclusion about whether the relationship between x and y is statistically significant." I welcome a discussion of why this is a worthless statement. Simply email me.

Lessons 08-10 are about probability, necessary for understanding statistical inference.

- We adhere to this convention: expected value and standard error apply to random variables. By contrast, average and standard deviation apply to lists of numbers (data).
- The relationship: take a list of numbers. Draw one at random. The average of the list equals the expected value of the number you will draw, and the SD of the list equals the SE of the number you will draw.

Lessons 11-13 are about inferential statistics and apply only to data gathered by a probability method.

"Difficulties strengthen the mind, as labor does the body." —SENECA

Grade Calculation

40% Homework Average 20% Test 1 20% Test 2 20% Test 3

To keep grading fair, we ignore requests for special treatment, including extra credit, bonus points, or rounding.

Test Policies

Tests are taken in the classroom during class time. Bring your own laptop with Microsoft Excel installed and ready to use. **These are based on what we cover in class.**

- \circ You are responsible for test announcements made in class.
- You are responsible for technical issues, such as your laptop's battery, connectivity, and functionality.
- o Bring your Comet Card on test day and expect assigned seating.
- Only Excel is allowed during the test. Use it for your calculator and your "scratch work." You may prepare an Excel file (with multiple worksheet tabs) as your "cheat sheet" and have it open during the test.
- No collaboration and no other sources allowed. If you are caught cheating, copying, or collaborating, or if you use anything besides Excel during the test (such as online messaging, searching, etc.), you will get a score of 0% on the test and may be referred to an academic dishonesty hearing.
- Read <u>https://www.utdallas.edu/conduct/dishonesty</u> and see the student code of conduct: <u>https://policy.utdallas.edu/utdsp5003</u>
- If you wake up sick, or some other emergency keeps you from coming to the test, email the instructor immediately. (Additional comments below in the FAQ.)

Homework policies

Homework consists of problem sets to be completed in eLearning. Roughly one homework set per week. **These are based on what we cover in class.**

- You are responsible for homework announcements made in class.
- There are no individual homework extensions nor makeups for any reason.
- Working with others, referencing notes and books, and using online sources are all fine for homework. However, you are expected to be able to solve the problems on your own.
- \circ $\;$ You are expected to submit only your own work.
- Submit the eLearning assignment at least 6 hours before the hard deadline to avoid technical issues and other problems.

"All things are difficult before they are easy." —THOMAS FULLER

FREQUENTLY ASKED QUESTIONS

Do you curve grades? I add a flat number of points to everyone's score on a test if the average and/or median are low. (Is that curving?) JSOM policy restricts how much I can do. When we finish grading a quiz, I always look at the score distribution, checking that the median score is between 75% and 80%, and that the A-range is about 40% of the class.

Is there extra credit? There is no extra credit separate from the assigned work. Bonus points may appear on homework and tests. It may be possible to get over 100% on a test or homework if you answer everything. Please do not ask for extra credit, bonus projects, second attempts, and the like. I have to ignore these requests, mainly to ensure fairness to the whole class. Instead, please complete all the assigned work.

What if I have to miss a test? Notify the instructor *immediately* if an emergency prevents you from taking a test. We can usually work out a make-up test with prompt notice.

- If an emergency (such as you wake up sick) prevents you from taking a test, notify the instructor immediately with an email.
- If applicable, be aware of the religious holy day policies, found here: https://catalog.utdallas.edu/2024/undergraduate/policies/religious-holy-days
- No make-ups will be offered for your own personal matters (such as family trips or weddings) or other non-emergency reasons.
- Technical issues (like a computer crash or the internet going out) are your responsibility.
- If you miss a test and do not contact the instructor before the end of the quiz day, you will receive a grade of 0% for the missed quiz.

How can l improve my grades? Go to every class, actively pay attention, and regularly reach out to the teacher by email and/or in person. Complete all the assigned work well in advance of the deadline and submit your own work only. See additional comments in Advice for Success below.

CLASSROOM POLICIES

- \circ $\,$ In general, please treat others the way you want them to treat you.
- You are expected to attend every class and participate regularly (at least listening).
- Please show courtesy and charity to other students and the instructor. Focus on the lecture and raise your hand to contribute. Do not have side conversations.
- \circ $\;$ Avoid leaving early and avoid arriving late.
- At the instructor's discretion, you may be asked to leave the classroom and/or receive a grade penalty for behavior that interferes with class.
- Skipping class and not participating will bring you lots of stress and difficulties. Instead, always come to class, sit as close to the front as possible, and participate regularly (in class, in email, or in office hours).

"That is the one eternal education: to be sure enough that something is true that you dare to tell it to a child." —G. K. CHESTERTON (FROM THE BOOK WHAT'S WRONG WITH THE WORLD)

ADVICE FOR SUCCESS

>Attend every class and sit as close to the front as possible.

This is true for any college course, regardless of the presentation skill of the instructor. If you care about your grade and GPA, at a minimum you should attend every class. Go to every session, put away your smartphone, and actively participate (even just listening). These actions train your brain to take the course seriously, and they encourage the presenter, thus improving the quality of the class. Everyone benefits from a good audience and a full house.

>Build time into your weekly schedule for the course outside of class time.

This is true for any college course. Set aside at least 5 hours (give or take) per week outside of class session, depending on your skill level. Allow time not only for homework, but also for reading the textbook, reviewing class notes, and practicing the examples. If study and practice are not planned into your schedule, then they will not happen, and the quizzes will be very hard.

>Email the instructor early and often.

Please do not let your first email to the instructor be about a low grade, and please do not wait until the end of the semester. Instead, email the instructor as soon as you have any questions, concerns, or confusions.

>Make emails useful.

Write the email yourself. This is good for you: the exercise of formulating your question often helps you understand a topic. *Please do not use AI*. Please avoid fancy words, formalities, and generic pleasantries, such as "I hope this email finds you well." Make sure to include your name, course, AND section number, so I can find your records quickly if needed. And finally, please do not ask for special exceptions to the grade policies! I absolutely must grade everyone fairly, using the rules given in this syllabus.

>Expect to make mistakes, get frustrated, and try repeatedly.

We learn as much when things go wrong as when they go right. ("Get messy! Make mistakes!" as Ms. Frizzle says.) All of us (students and instructors) will make mistakes and learn from them.

>Take care of yourself.

This is true for any work. Your physical, mental, emotional, and spiritual health are interrelated. Get plenty of sleep each night on a regular schedule. Maintain a regular diet (and avoid sugar/caffeine spikes around exam times). Limit time in social media. (I guarantee that, if you go at least 4 weeks without using any social media, you will notice an improvement in your physical and mental wellbeing. How often do you come away from social media sessions feeling refreshed, rejuvenated, and enlightened?) Spend time with friends and/or family in person. Engage in wholesome activities and entertainment. If you feel better in general, you will do better in your classes.

GENERAL SYLLABUS STUFF

>>University restrictions about class recordings

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, **students are expressly prohibited from recording any part of this course**. The instructor's recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the <u>Student Code of Conduct</u>.

>>University restrictions about class materials (lecture note files, instructor notes, solutions, etc.) The materials posted by the instructor may be downloaded during the course; however, **these materials are for registered students' use only**. Classroom materials may not be reproduced or shared with anyone not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the <u>Student Code of Conduct</u>.

>>University technical requirements and help

In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the <u>Getting Started with</u> <u>eLearning webpage: https://ets.utdallas.edu/elearning/students/current/getting-started</u>

This course can be accessed using your UT Dallas NetID account on the <u>eLearning</u> website. Please see the course access and navigation section of the <u>Getting Started with eLearning</u> webpage for more information. To become familiar with the eLearning tool, please see the <u>Student eLearning Tutorials</u> webpage.

UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The <u>eLearning Support Center</u> includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the online <u>eLearning Help Desk</u>. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

>>UT Dallas syllabus policies and procedures:

The information contained in the following link constitutes the university's policies and procedures segment of the course syllabus.

https://go.utdallas.edu/syllabus-policies

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

>>Academic Support Resources

>>Comet Creed

The information contained in the following link lists the University's academic support resources for all students. Please go to <u>Academic Support Resources</u> webpage for these policies:

https://provost.utdallas.edu/syllabus-policies/#academic-support-resources

Various lawyers have suggested we tell you that the content of this syllabus may change at the instructor's discretion.