

Math D10.44Z – Introductory Statistics
TR: 6:30-8:45pm (online - [link](#))

Prof Name : Robert (Bob) Hingtgen

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Office Hours: TR 4:30-6pm, and by appointment - [link](#)

Phone: (254)495-8528

Course Prerequisites: Intermediate algebra or equivalent (or higher), or appropriate placement beyond intermediate algebra

Course Description: This course is an introduction to data analysis making use of graphical and numerical techniques to study patterns and departures from patterns. The student studies randomness with an emphasis on understanding variation, collects information in the face of uncertainty, checks distributional assumptions, tests hypotheses, uses probability as a tool for anticipating what the distribution of data may look like under a set of assumptions, and uses appropriate statistical models to draw conclusions from data. The course introduces the student to applications in engineering, business, economics, medicine, education, social sciences, psychology, the sciences, and those pertaining to issues of contemporary interest. The use of technology (computers or graphing calculators) will be required in certain applications. Where appropriate, the contributions to the development of statistics by men and women from diverse cultures will be introduced. This Statistics course is a required lower-division course for students majoring or minoring in many disciplines such as data science, nursing, business, and others.

Text: *Introductory Statistics*, [here](#)

Author: Barbara Illowsky & Susan Dean

Homework: Homework will be assigned approximately every week and due dates will be on each assignment (posted on canvas). Late assignments will not be accepted without extenuating circumstances. You may work with other students on the assignment, but you must submit your own solutions.

You will be graded on the presentation and clarity of your assignments as well as the viability of the solution. How you get to an answer (and communicating this process) will be weighted just as highly if not more highly than the answer itself when it comes to grading. This goes for solutions on exams as well.

Assignments will be posted on canvas at least a week before they are due. Student work on assignments will also be uploaded as a pdf for feedback.

Quizzes/Exams: There will be 3 exams during the course. Makeup exams will not be given without pre-approved or approved reasons (depending on the context of the situation).

Reviews for each exam will be available at least one week before each exam is taken. The quizzes/exams will be available over a particular window of time, but you are free to choose when you take it in that window. However, please understand and be careful, once you decide to take the quiz/exam you must complete and submit it within the time allotted. for the quiz/exam. For example, an exam will be available over a couple days, but the exam itself lasts for a fixed number

of hours. Submission of the quiz/exam will be similar to homework by uploading photos or scans of your work as a pdf file.

The official designated time for the final is 12/14 6:15-8:15pm

Canvas: Please check Canvas regularly for updates, announcements, and posts.

Email: A small note. I will check my email roughly 2 to 3 times a day. I will try to answer as many questions as I can there. Do understand that math questions are better answered in person and so I may ask you to attend office hours or schedule a meeting. Common questions that come up often may be put in a FAQ on Canvas, and I may refer you to there. Also, if something is urgent, please call or leave a message. Due to the nature of email, I can not guarantee immediate communication.

Attendance: Students are expected to attend all lectures. Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Learning Outcomes and Objectives:

- Explore statistical techniques and process statistical information in order to make decisions about the reliability of a statement, claim or "fact"; Identify the standard methods of obtaining data and identify advantages and disadvantages of each.
- Examine the nature of uncertainty and randomness and set up data collection methods that are free of bias; Distinguish among different scales of measurement and their implications.
- Organize, display, summarize, and interpret data using graphical and statistical techniques; Interpret data displayed in tables and graphically; Calculate measures of central tendency and variation for a given data set.
- Use probability to model and understand randomness; Apply concepts of sample space and probability.
- Examine distributions of data using graphical and analytical methods; Calculate the mean and variance of a discrete distribution.
- Describe data distribution through the study of sampling distributions; Distinguish the difference between sample and population distributions and analyze the role played by the Central Limit Theorem.
- Estimate parameters by constructing point estimates and confidence intervals; Calculate probabilities using normal and t-distributions; Construct and interpret confidence intervals.
- Compose probability statements about how confident one can be about making decisions based on data and construct the Type I and Type II error probabilities based on this decision; Determine and interpret levels of statistical significance including p-values; Interpret the output of a technology-based statistical analysis; Identify the basic concept of hypothesis testing including Type I and II errors; Formulate hypothesis tests involving samples from one and two populations; Select the appropriate technique for testing a hypothesis and interpret the result.

- Compose conjectures about bivariate and ANOVA theoretical models; Use linear regression analysis and ANOVA for estimation and inference, and interpret the associated statistics.
- Use appropriate statistical techniques to analyze and interpret applications based on data from disciplines including business, social sciences, psychology, life sciences, health sciences and education.

Academic Accommodations: If you have a documented disability and wish to discuss academic accommodations, or if you would need assistance in the event of an emergency evacuation, please inform me as soon as possible.

Academic Dishonesty: By enrolling in this class, you agree to uphold the standards of academic integrity as outlined in the current De Anza college catalogue. Dishonesty includes but is not limited to having someone other than yourself take the course, plagiarizing, knowingly assisting another student in cheating or plagiarism, or knowingly furnishing false information to college staff, faculty, administrators or other officials. If you are observed cheating, you may receive an F on the assignment/exam and be dismissed from the course. Furthermore, the incident will be reported to the Dean of Student Development for review and a note will be made in your school records. Please do not give me any reason to suspect cheating.

Code of Student Conduct: The college has an obligation to specify those standards of behavior essential to its educational mission and campus life. The students who are in violation of the Code of Student Conduct are subject to disciplinary sanctions which apply at all times on campus as well as to any off-campus functions sponsored or supervised by the college.

Grade Distribution:

Average Homework Grade	20 %
Average Quiz Grade	20 %
Average of Midterm Exams	40 %
Final Exam	20 %

Grade Scale:

A	93 - 100%	B -	80 - 83%	D +	68 - 70%
A -	90 - 93%	C +	78 - 80%	D	63 - 68%
B +	88 - 90%	C	73 - 78%	D -	60 - 63%
B	83 - 88%	C -	70-73%	F	0-60%

Lastly, some advice

About the internet and this class: Even if we were not online, this is becoming an issue that is unavoidable. I am well aware of chegg, stackexchange, ChatGPT, of the tons of websites that exist and will exist in the coming years solely to provide answers to college courses. I can not stop you from looking at them, and I will not try to. The internet is a great resource. However, be careful, there be dragons. Not all sources of info on the internet are great or even correct/accurate at times. If you are unsure of the authenticity of something, feel free to ask me. For now, generally

1. *Do not pay for answers* - Save your money. I have office hours, and will posting solutions most things. And there are many other readily available resources to make use of.
2. *Be careful of 'Tricks'* - You will sometimes find different methods for solving problems than what I present. Be careful. Sometimes they are not actually different, they just look different. But at other times, you find a trick that is faster than what we're doing but actually only works in a simple case and we are teaching you something more general. This can trick you into believing something is generally true and finding out (painfully) later that it is not. The solution to this is, just ask. I have my reasons for showing you the methods I do, but I'm more than fine with pointing out shortcuts as long as limitations are understood and making connections between other sources and what I provide.
3. *Do not 'Copy'* - There is a huge (HUGE) difference between reverse engineering something you find versus directly copying something you find. I'd prefer you not rob yourself of discovery when working problems, but sometimes working forwards is not time efficient and life (or other classes) is not permitting you that extra time. The main goal of the course is understanding these theories and ideas. So, all I ask, if you do not have time and find yourself giving into the temptation of what is out there, make sure for yourself and your own learning that you understand every step of what you are looking at (and write it out in your own words for yourself). It is one of the best ways (I know of) to internalize these concepts and learn them in a way that sticks.

And please, seek help as it's needed, ask questions, tons of questions, be shameless about your questions. Never curtail your curiosity. If you already knew the things you were unsure of, then this class would be moot. And there is likely plenty you know that reaches further than you expect. Deep down, I believe everyone who yearns to know math (or anything really) is capable entirely of it. And though we all take different journeys to that destination, it is my goal to help you along the way. So, my point is, this goes both ways. Let me know ASAP if I'm not clear or if something I said did not 'click'. It is hard for me to solve problems I am unaware of, so help me be aware of any problems you think I need to work on.

Tentative Course Plan: This is the projected plan for the course. This is subject to change as the quarter develops, but I will aim to change this as little as possible.

Date	Event
9/26	Syllabus, Intro to Course, Chapter 1
9/28	Chapter 1
10/3	Chapter 2
10/5	Chapter 2, HW1 Due
10/10	Chapter 3, Quiz 1
10/12	Chapter 3, HW2 Due, Exam 1 Opens
10/17	Chapter 4, Quiz 2
10/19	Chapter 4, HW3 Due
10/24	Chapter 5, Quiz 3
10/26	Chapter 6, HW4 Due
10/31	Chapter 7, Quiz 4
11/2	Chapter 8, HW5 Due
11/7	Chapter 8, Quiz 5
11/9	Chapter 9, HW6 Due, Exam 2 Opens
11/14	Chapter 9, Quiz 6
11/16	Chapter 10, HW7 Due
11/21	Chapter 11, Quiz 7
11/23	Thanksgiving
11/28	Chapter 11, Quiz 8, HW8 Due
11/30	Chapter 12, HW9 Due, Exam 3 Opens
12/5	Chapter 12, Quiz 9
12/7	Chapter 13, HW10 Due
12/11-15	Final Exam Period

Other Important Dates:

- 10/15 12pm - Exam 1 closes
- 11/12 12pm - Exam 2 closes
- 12/3 12pm - Exam 3 closes

Student Learning Outcome(s):

- Organize, analyze, and utilize appropriate methods to draw conclusions based on sample data by constructing and/or evaluating tables, graphs, and numerical measures of characteristics of data.
- Identify, evaluate, interpret and describe data distributions through the study of sampling distributions and probability theory.
- Collect data, interpret, compose and evaluate conjectures, and communicate the results of random data using statistical analyses such as interval and point estimates, hypothesis tests, and regression analysis.

Office Hours:

Zoom,By Appointment T,TH 4:30 PM 6:00 PM

Also on Zoom but scheduled if the student needs them outside the usual office hours.