STOR 155: Introduction to Data Models and Inference

Welcome to STOR 155! Statistics is a vibrant field of study as well as a powerful tool in modern science, business, and technology. This course will introduce you to the field by covering a broad range of topics centered around the fundamental concepts and tools of statistical inquiry, including:

- Data sampling, experimental design, and analysis;
- Correlation and regression;
- Basic probability (random variables, expected values, probability distributions);
- Hypothesis testing and confidence intervals; and
- Spreadsheet software as a data processing tool.

I am excited to share these fascinating ideas and techniques with you! This syllabus serves as the survival guide for this course, where you can find all the administrative info you need to know, such as office hours, grading policy, and a preliminary course schedule. I reserve the right to alter this syllabus as the course progresses to improve its accuracy, and will announce any such changes in advance so that you will be able to adjust your calendar accordingly. Feel free to e-mail me with any questions!

Course Goals and Learning Objectives

Course Goals

Broadly, this course will enable you to:

- Explore data by describing patterns and departures from patterns;
- Consider the roles of sampling and experimentation in study design and implementation;
- Explore random phenomena using probability and random variables; and
- Estimate population parameters and test hypotheses through methods of statistical inference.

Focus Capacity

As part of the general education curriculum at UNC-Chapel Hill, this course will satisfy the ***Quantitative Reasoning*** focus capacity.

Learning Outcomes

There are 5 key learning outcomes for this course:

1. Summarize, interpret, and present quantitative data in mathematical forms, such as graphs, diagrams, tables, or mathematical text.
2. Develop or compute representations of data using mathematical forms or equations as models and use statistical methods to assess their validity.
3. Make and evaluate important assumptions in the estimation, modeling, and analysis of data, and recognize the limitations of the results.
4. Apply mathematical concepts, data, procedures, and solutions to make judgments and draw conclusions.
5. Synthesize and present quantitative data to others to explain findings or to provide quantitative evidence in support of a position.

To move towards achieving these outcomes, regularly ask yourself the following central questions as we progress through the course:

1. What is the role of mathematics in organizing and interpreting measurements of the world?
2. How can mathematical models and quantitative analysis be used to summarize or synthesize data into knowledge and predictions?
3. What methodology can we apply to validate or reject mathematical models or to express our degree of confidence in them?

Your answers should evolve as you become more familiar with the tools, techniques, and decisions that contribute to statistical practice!

Course Structure

Instructor	Dr. Teressa Bergland Email: teressab@unc.edu Office: Hanes 310 Office Hours: Monday 10 AM - 1 PM, Wednesday 1 PM – 4 PM
Instructional Assistant	Hanieh Jamshidian Email: hanijam@unc.edu Office Hours: TBA
Course Website	https://uncch.instructure.com/courses/114835
Lecture Schedule	TuTh 2:00 PM – 3:15 PM, Gardner Hall, Room 105
Useful Zoom Links	Dr. Bergland's online office (by appointment only): https://unc.zoom.us/j/6246497118 Tutorial sessions (open to all): TBA in Week 1

Course Texts	OpenIntro Statistics, 4th Edition by Diez, Barr, and Rundel PDF of textbook available on Canvas
Course Format and Delivery	This 3-credit hour course includes two in-person lecture meetings per week at the scheduled class time, along with regular (1-2x per week) homework in WebAssign, 2 midterm exams, and 1 final exam. All exams will be held in-person. This course is classified as in-person, meaning: • Students attend class in person; remote students cannot register for this mode. • Students will attend classes and take exams on specific dates/times and at a specific physical campus location throughout the semester.
Credit Hours	3
Prerequisites	MATH 110 (Algebra) or equivalent
Target Audience	This course is designed for Statistics and Analytics majors and non-majors alike who require development of statistical skills for data analysis.

Assessments and Grading

Your final grade in the course will be computed by taking a weighted average of your performance on all contributing assessments, using the following weights.

Assessment	Frequency	% of Grade
Attendance	Daily	2%
Homework	Daily/Weekly	28%
Midterm 1	Once **(Feb 10)**	22.5%
Midterm 2	Once **(Mar 31)**	22.5%
Final	End of term	25%

Your percentage grade will be converted into a letter grade according to the following table. Final grades are up to my discretion, but this scale is a GUARANTEE – for example, if your final percentage grade is exactly 80%, you will earn ***at least*** a B- in the course.

Letter	Percentages	Meaning
A	93.00 to 100	Excellent: Far exceeds standard for progression
A-	90.00 to 92.99	
B+	87.00 to 89.99	Good: Exceeds standard for progression
B	83.00 to 86.99	
B-	80.00 to 82.99	
C+	77.00 to 79.99	Fair: Meets standard for progression

C	73.00 to 76.99	
C-	70.00 to 72.99	
D+	67.00 to 69.99	Needs work: Shows growth, but does not meet standard for progression
D	60.00 to 66.99	
F	Under 60	Insufficient

More details on each assessment type that will contribute to your final grade:

Attendance	Starting with the **third class** (January 15), attendance will be taken during class meetings with a PollEverywhere question. If you provide a **reasonable response** to the poll question, you will be counted present; otherwise, you will be counted absent. Your first two absences will not count against you, but absences from the third one onward will (unless you have university-approved absences or consent from the instructor due to extenuating circumstances). **You are expected to be available during our assigned class time throughout the semester.** Please note that I may use PollEverywhere more than once per class period, but only one of the questions will be used for attendance. **The attendance poll will not always be the first poll.** Answers do not need to be correct to be considered reasonable. An extra attendance point can be gained by completing the Syllabus Quiz on Canvas by **11:59 PM on Thursday, January 15, 2026**. This quiz will be graded for participation, not correctness, and is meant solely to inspire you to read the syllabus before the semester gets too busy. If you take the Syllabus Quiz by the deadline, you will gain **1 additional free absence** that will not be counted against you when computing your Attendance score.
Homework	All sections of STOR 155 will be using WebAssign for homework. Use this link to enroll in our course **by Tuesday, January 13, 2026**: unc 8459 3079 Homework will be assigned after the majority of class meetings, organized by topic. Due dates will be announced in class, and **tentative** due dates are provided on the schedule below. Completed work will always be due at **11:59 PM** on the announced date. 24-hour deadline extensions will be available for all homework assignments with a **25% penalty** applied for lateness. You do not need to inform me if you will be submitting your assignment less than 24 hours late, but it is appreciated. To cover for missed questions and/or assignments, the equivalent of **one assignment's worth of points** will be added to your homework point total at the end of the semester, up to but not exceeding the maximum number of points possible. Since different assignments will be worth different numbers of points, this number of added points will be calculated by averaging the point totals of all assignments.
Exams	Both midterms and the final exam are required, and **no make-up exams will be administered unless** you obtain a university-approved absence (UAA) from the registrar's office. All exams will be written-only, i.e. no phones or computers will be permitted during any exam. Midterm exams will be administered in person

	during our scheduled class time; the final will take place as scheduled by the university. **Please notify me as soon as you become aware of an exam conflict so that a timely make-up exam can be scheduled.** If you work with or take answers from anyone else on an exam, you will receive a score of 0 and be reported to the university. Any dispute on the grading of an exam should be brought to me **no more than 1 week** after graded exams are returned.

Course Resources and Advice

Tutorial Sessions	Evening tutorial sessions will be run for all of STOR 155 every Sunday through Thursday, on Zoom from 7:00 - 8:00 PM, starting January 18. The link for these sessions will be posted sometime during Week 2. **These sessions act as extra office hours run by experienced instructional assistants who enjoy tutoring in statistics.** Take advantage of their expertise and willingness to help!
Cooperative Learning	**Your classmates are a valuable resource!** I encourage you to discuss course content with your friends and classmates as you are working on your weekly assignments. Regardless of your academic background, you will learn more in this class if you work with others than if you do not. Ask questions, answer questions, and share ideas liberally. These interactions should never be one-way; everyone should bring something to the table when collaborating on homework or in-class examples. Support each other's learning!
Piazza	To support cooperative learning, we will use Piazza (sign up here) to ask and answer questions about homework, course content, and logistics. This system is designed towards getting you help fast and efficiently from classmates, instructional assistants, and myself. Rather than emailing content questions to the course staff, I encourage you to post your questions on Piazza. Since I have hundreds of students each semester, I get a LOT of emails, so this is the best way to make sure that you get a response. You might even find that your question or issue has already been brought up and answered by me or your classmates!
Technology In Class	Problem-solving in this class will often require the use of a calculator. Calculators will be permitted on the exams, so you should make sure you have one you are comfortable with; the best way to do this is to bring it to class and practice using it for our problems! **Generative AI tools such as Copilot and ChatGPT are not permitted for this coursework.** This includes both the homework and the exams. Any use of these tools to complete homework or exam problems will be considered an instance of academic dishonesty and will be referred to the Honor System.

	You may make use of generative AI tools as study aids, such as for additional explanations and clarifications of concepts; in fact, if you receive a response that you find especially helpful, I encourage you to post your question and the response on Piazza for the benefit of your classmates! However, **please be aware of the risk of AI hallucinations** when using these tools, as a poor answer or vague response may impede your learning. One thoughtful approach would be to ask on Piazza about the validity of an AI-generated statement you find interesting, compelling, or helpful, just to make sure it is accurate.

University Policies and Accommodations

EOC Accommodation	The Equal Opportunity and Compliance Accommodations Team (UNC Equal Opportunity and Compliance Office) receives requests for accommodations for disability, pregnancy and related conditions, and sincerely held religious beliefs and practices through the University's Policy on Accommodations. EOC determines eligibility and reasonable accommodations consistent with state and federal laws. You must self-identify through the Equal Opportunity and Compliance Office to receive services or accommodation. If you qualify for accommodations under this policy, **inform me as early as possible** so we can ensure your needs are met. If you aren't sure whether you qualify for accommodations, **go to the Compliance Office and find out** so we can ensure your needs are met. I am committed to ensuring all students have the opportunity to succeed in my course.
UNC Attendance Policy	As stated in UNC's Class Attendance Policy, no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences: • Authorized University activities: The University Approved Absence Office (UAAO) website provides information and FAQs for students related to University Approved Absences. • Disability/religious observance/pregnancy/short-term military service, as required by law and approved by the Equal Opportunity and Compliance Office (EOC), or in the case of short-term military service, the Dean of Students • Significant health condition and/or personal/family emergency as approved by the Office of the Dean of Students, Gender Violence Service Coordinators, and/or the Equal Opportunity and Compliance Office (EOC).
Counseling & Psychological Services	UNC-Chapel Hill and I are strongly committed to addressing the mental health needs of a diverse student body. The Heels Care Network website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically

	appropriate services. Go to the CAPS website or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.
Title IX	Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC or by contacting the University's Title IX Coordinator, Elizabeth Hall, or the Report and Response Managers in the Equal Opportunity and Compliance Office . Please note that I am designated as a Responsible Employee, which means I must report to the EOC any information I receive about the forms of misconduct listed in this paragraph. If you'd like to speak with a confidential resource, those include Counseling and Psychological Services, the University's Ombuds Office, and the Gender Violence Services Coordinators. There are additional resources at safe.unc.edu.
Student Code of Conduct	Students are bound by the UNC-Chapel Hill honor code when taking exams and submitting written work, which states "It shall be the responsibility of every student at The University of North Carolina at Chapel Hill to obey and support the enforcement of the Honor Code, which prohibits lying, cheating, or stealing when these actions involve academic processes or University students or academic personnel acting in an official capacity." The submission of all exams and written work signifies understanding and acceptance of these requirements.
Termination of Course Registration	A registered student may terminate registration in three possible ways: cancellation, withdrawal, and suspension, depending on the circumstances. For definitions of these terms and the steps necessary to process each of them, see the University Policy Memorandum.

Course Schedule (subject to change)

Class	Day	Date	Topic(s)	Book Section(s)	Assignments
1	Th	Jan 08	Introductions, Case Study	1.1	
2	Tu	Jan 13	Basics of Data	1.2, 1.3	
3	Th	Jan 15	Data Collection + Sampling Strategies	1.3	HW1: Case Study + Basics of Data
4	Tu	Jan 20	Experiments, Numerical Data	1.4, 2.1	HW2: Collection + Sampling Strategies

5	Th	Jan 22	Numerical Data, Categorical Data	2.1, 2.2	HW3: Experiments
6	Tu	Jan 27	Correlation + Linear Regression	8.1, 8.2	HW4: Numerical Data HW5: Categorical Data
7	Th	Jan 29	Linear Regression	8.2	HW6: Correlation
8	Tu	Feb 03	Basic Probability	3.1	HW7: Linear Regression
9	**Th**	**Feb 05**	**Wrap-up, Review for Midterm 1**		HW8: Basic Probability
10	**Tu**	**Feb 10**	**Midterm Exam 1**		
11	Th	Feb 12	Conditional Probability	3.2	
12	Tu	Feb 17	Conditional Probability	3.2	
13	Th	Feb 19	Random Variables	3.4	HW9: Conditional Probability
14	Tu	Feb 24	Random Variables	3.4	
15	Th	Feb 26	Density Curves, Normal Distributions	4.1	HW10: Random Variables
18	Tu	Mar 03	Normal Distributions	4.1	
19	Th	Mar 05	Bernoulli Distributions, Geometric Distributions	4.2	HW11: Normal Distributions
20	Tu	Mar 10	Binomial Distributions	4.3	HW12: Geometric Distributions
21	Th	Mar 12	Binomial Distributions	4.3	
	Tu	Mar 17	No class – Spring Break		
	Th	Mar 19	No class – Spring Break		
22	Tu	Mar 24	Intro to Statistical Inference	5.1	HW13: Binomial Distributions
23	**Th**	**Mar 26**	**Wrap-up, Review for Midterm 2**		HW14: Statistical Inference Basics
24	**Tu**	**Mar 31**	**Midterm Exam 2**		
	Th	Apr 02	No class – Well-Being Day		
25	Tu	Apr 07	Confidence Intervals: Proportions	5.2	

26	Th	Apr 09	Hypothesis Tests: Proportions	5.3	HW15: Confidence Intervals
27	Tu	Apr 14	Inference for a Difference of Proportions	6.2	HW16: Hypothesis Tests
28	Th	Apr 16	t-Distribution and Inference for Means	7.1	HW17: Inference for Difference of Proportions
29	Tu	Apr 21	Inference for Paired Data and Difference of Means	7.1	HW18: t-Distribution, Inference for Means
30	Th	Apr 23	Wrap-up, Review for Final		HW19: Inference for Paired Data and Difference of Means
FINAL EXAM: Thursday, April 30, 12:00pm – 3:00pm, Gardner 105					