STOR 155.04 – Spring 2025
Introduction to Data Models and Inference

Learning Objectives

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 simulation; and
- estimate population parameters and testing hypotheses through methods of statistical inference.

Course Topics

Data analysis; correlation; linear regression; sampling strategies; basic probability; random variables; normal and binomial distributions; central limit theorem; hypothesis testing and confidence intervals for means, proportions, and regression parameters; use of Excel.

Basic Information

Instructor	Andrew Ackerman (Andy) Email: atacker@email.unc.edu Office Hours: T, Th 9:15-11:15 am or by appointment
Instructional Assistants	Grace Smith Email: gvsmith@unc.edu Office Hours T, W 10:30-11:30 am https://unc.zoom.us/j/3995492567
Contacting us	When emailing me, please simply call me Andy, and include "155-04" in the subject line. You may include screenshots or photos of your scratch work.
Course Mode	In-Person unless otherwise advised. In the case of a transition to purely virtual instruction, lectures will continue synchronously via zoom and exam policies will be made explicit.
Canvas link	https://uncch.instructure.com/courses/80290
Lecture	TTh 8:00-9:15 am Hanes 120
Course materials	The textbook is *OpenIntro Statistics, 4e* by Diez, Barr, and Rundel. This book is **legally free**. The PDF is in Canvas Files. Homework will be online using **Webassign.** You can buy the access key using the UNC Bookstore website or buy access at www.webassign.net. You will need to make an account at www.webassign.net, and enter the Class Key **unc 2231 9603** to access our section. If you have financial aid, please contact the UNC Bookstore to get access at reduced cost.
Credit hours	3
Prerequisites	Math 110 (Algebra) or equivalent
Target Audience	This course is designed for Statistics and Analytics majors, and students from other majors who require experience with statistical skills for data analysis
Office hours	Office hours are your time to ask me anything you want. My sole stipulation is that you should have attempted a homework problem before you ask me about it.

	My hope is that holding multiple office hours on three different days will accommodate the diversity of schedules inherent to such a class. That said, if you find yourself unable to attend office hours, feel free to email me and set up an appointment.
Tutorial sessions	Every night before any STOR 155 section meets, a tutorial will be offered remotely on Zoom from **7 – 8 pm**. Generally, this means Sunday – Thursday. The tutorial session is basically a shared office hour for all sections of STOR 155 run by an IA. https://unc.zoom.us/j/94414304287

Final Grade Computation

Assessments	Date	Percent
Homework	2/Week	20%
Midterm 1	Feb. 4	25%
Midterm 2	Mar. 20	25%
Final Exam		30%

A	93 or above
A-	90 to 92.99
B+	87 to 89.99
B	83 to 86.99
B-	80 to 82.99

C+	77 to 79.99
C	73 to 76.99
C-	70 to 72.99
D+	67 to 69.99
D	60 to 66.99
F	Below 60

Course Assessments

Homework	All sections of STOR 155 will be using Webassign for homework. See **Course materials** above for instructions on Webassign. Working with other students on homework is encouraged. Homework will be assigned roughly three times per week. Late assignments will not be accepted and will receive a grade of 0, and no extensions will be granted except for University Excused Absences (this includes positive Covid test results). This is to ensure that you stay up to date on your assignments. Extra attempts on Webassign questions will not be granted. Any dispute regarding the grading of a homework assignment should be brought to either IA or myself no more than 1 week after the deadline of an assignment. Questions on individual problems can be asked via WebAssign's messaging capabilities.
Exams	There will be two midterms and a final exam. These are required and no make-up exams will be granted unless your absence is approved by the university. **Your final exam score will replace your lowest midterm if it improves your final average.**

	Missed exams will be made up by adding weight to the final. Exams will be done during the scheduled class time. If you work with any classmate or another student at UNC on your exam, you will receive a 0% and be reported to the university. You cannot have three finals within a 24-hour period, and therefore you will need to be excused from the regularly scheduled final exam. In this scenario, you must obtain a dean's excuse and discuss the situation with me at least two weeks before the regularly scheduled final exam so that an alternative arrangement can be made.

Course Policies

Teaching Philosophy	My general approach aims to make two principles abundantly clear: there are no (sincere) bad questions, and education is only one facet of your life. To the first point, if you ask me a question out of genuine curiosity or confusion, I guarantee to respect and attend to it regardless of the level of complexity. Note, I do not claim to always have the answer, and certain questions may require an outside (office hours) conversation. But my guarantee is to provide an answer when I am able and search with you when unable. The flip side of this guarantee is your willingness to keep me accountable. Ask questions. If you are confused, please reach out for help. If in-class questions are too daunting, take advantage of office hours, tutorial sessions, or electronic communication. As to the second point, while I am ultimately a very ardent advocate of the merits of education, I want to reiterate that no single facet of your life – perhaps least of which performance in STOR 155.04 – fully defines you as a person. This is not to say that this, or any class, is unimportant, rather that this class is meant to enable and instruct not to define.
Honor Code	It is my aim to make my expectations for acceptable and original work as clear and explicit as possible. Gray areas frustrated me as a student, so I aim to prevent them as an instructor. To that end, students are bound by UNC's honor code in taking exams and in written work, and the submission of said work signifies understanding and acceptance of those requirements. More specific to this course, collaboration is not only permitted but *encouraged* on homework and homework alone. Exams, by contrast, will be completed individually. I recognize that exams can be immensely stressful, and I do not intend to add to that burden. That said, my job is to cultivate and assess your *personal* understanding. Insofar as individual exams serve this purpose, they will be preferred. Please consult with me if you have any questions about the honor code. Asking for clarification in advance is far preferred to asking for forgiveness post-facto.
Attendance Policy	Lecture attendance is not required. That said, class participation is fundamental to success in this class.
Mask Requirements	In accordance with the UNC mask policy, masks are optional for all students and instructors.
Technology Use	You are welcome to bring a calculator to class. We will also use Excel on your laptops frequently. Technology can support student learning, but it can also become a distraction. You should not use laptops or other devices for entertainment during class and should not display any material on the laptop which may be distracting or offensive to your

	fellow students. Laptops should only be used for legitimate classroom purposes, such as coding, taking notes, or downloading class information from Sakai. E-mail, messaging, surfing the Internet, reading the news, or playing games are not considered legitimate classroom purposes. Such inappropriate laptop use is distracting to those seated around you and is unprofessional.
Syllabus changes	I reserve the right to make changes to the syllabus, including test dates and grade computation. These changes will be announced as early as possible so that students can adjust their schedules.

University Resources for Students

Learning Center	The UNC Learning Center is a great resource both for students who are struggling in their courses and for those who want to be proactive and develop sound study practices to prevent falling behind. They offer individual consultations, peer tutoring, academic coaching, test prep programming, study skills workshops, and peer study groups.
Tutorial	Every Sunday through Thursday evening, a tutorial will be offered remotely on Zoom from 7:00PM - 8:00 PM. You can access these meetings using the link above. These sessions are run by experienced Instructional Assistants who enjoy tutoring in statistics. Take advantage of their services!
Accessibility Resources	UNC-Chapel Hill facilitates the implementation of reasonable accommodations for students with learning disabilities, physical disabilities, mental health struggles, chronic medical conditions, temporary disability, or pregnancy complications, all of which can impair student success. See the ARS website for contact and registration information: https://ars.unc.edu/about-ars/contact-us
Counseling and Psychological Services	CAPS is strongly committed to addressing the mental health needs of a diverse student body through timely access to consultation and connection to clinically appropriate services, whether for short or long-term needs. Go to their website: https://caps.unc.edu/ or visit their facilities on the third floor of the Campus Health Services building for a walk-in evaluation to learn more.
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. Please contact the Director of Title IX Compliance (Adrienne Allison - Adrienne.allison@unc.edu), Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu), Counseling and Psychological Services (confidential), or the Gender Violence Services Coordinators (gvsc@unc.edu; confidential) to discuss your specific needs. Additional resources are available at safe.unc.edu.

Ombuds Office	The Ombuds Office (https://ombuds.unc.edu/) is an impartial, confidential, and independent office within UNC that offers a safe space to any UNC members to discuss sensitive issues (for example, issues relating to power dynamic). They do not take sides and maintain complete confidentiality. All conversations with the Ombuds Office are "off the record."
Andy's Teaching Mentors	As a graduate Teaching Fellow, I am mentored by STOR professors Dr. Mario Giacomazzo (mgiacoma@email.unc.edu) and Dr. Jeff McLean (mclean@unc.edu). If you have an issue with the class that you feel uncomfortable raising with me, you may raise it with them confidentially. The Ombuds Office (above) is also an option.

Rough Course Outline (updated 1/4/25)

Class	Day	Date	Topics	Reading
1	Th	09-Jan	Introduction and Data Basics	1.1, 1.2
2	T	14-Jan	Sampling Strategies & Experiments, Numerical Data	1.3, 1.4, 2.1
3	Th	16-Jan	Numerical Data & Categorical Data	2.2
4	T	21-Jan	Basic Probability	3.1
5	Th	23-Jan	Basic Probability/Conditional Probability	3.2/3.3
6	T	28-Jan	Conditional Probability/Random Variables	3.4-3.5
7	Th	30-Jan	Review for Exam 1	
8	**T**	**4-Feb**	**Exam 1**	**Ch. 1,2,3**
9	Th	6-Feb	Normal Distribution	4.1
10	T	11-Feb	Normal Distribution/Geometric Distribution	4.2
11	Th	13-Feb	Binomial Distribution/Poisson Distribution	4.3,4.5
12	T	18-Feb	Introduction to Inference and Point Estimation	5.1
13	Th	20-Feb	Confidence Intervals (Single Proportion)	5.2
14	T	25-Feb	Hypothesis Tests (Single Proportion)	5.3
15	Th	27-Feb	Hypothesis Tests (Single Proportion)	5.3
16	T	4-Mar	Inference for a Difference in Proportions	6.2
17	Th	6-Mar	Inference for a Difference in Proportions	6.2
	T	11-Mar	*No Class – Spring Break*	
	Th	13-Mar	*No Class – Spring Break*	
18	T	18-Mar	Review for Exam 2	5.2

19	**Th**	**20-Mar**	**Exam 2**	**Ch. 4,5,6**
20	T	25-Mar	T-distribution/Inference for One Mean	7.1
21	Th	27-Mar	Paired Data	7.2
22	T	1-April	Inference for Difference in Two Means	7.3
23	Th	3-April	Correlation	8.1
24	T	8-April	Regression	8.2
25	Th	10-April	Leverage and Influence/Inference for Regression	8.3, 8.4
26	T	15-April	Sample Size for Given Error, Law of Large Numbers, Data Ethics	Misc.
	Th	17-April	*No Class – Wellness Day*	
27	T	22-April	Review for Final Exam	
28	Th	24-April	Review for Final Exam	
		Registrar's Website	**Final Exam**	**Comprehensive**