

Syllabus – STOR 555
Fall 2023 (August 21 – December 6)
Section 001, TuTh 11:00AM – 12:15PM
Gardner 105

(Updated on 8/21/2023)

Instructor: Jan Hannig

Phone: (919) 962-7511

Office: 330 Hanes

E-mail: jan.hannig@unc.edu

Instructor's Office Hours: (*on zoom*)

Course home page on

MW 10:30 – 11:30 AM

<https://hannig.cloudapps.unc.edu//STOR555/>

and by appointment

<https://uncch.instructure.com/courses/39700>

Zoom link for Office hours:

Zoom link for lectures (if needed)

<https://unc.zoom.us/j/99627403569?pwd=VWVHRm9ZaTJOTWRlVnlhb2dnaXMyZz09>

<https://unc.zoom.us/j/95446373438?pwd=c0MzNWc2K3Y3eEU4UXBHTzdnVmJHZz09>

Meeting ID: 996 2740 3569

Meeting ID: 954 4637 3438

Passcode: Hanes330

Passcode: Gardner105

Teaching Assistant: Charles Zhao

E-mail: charlesz@unc.edu

TA info: B-7 Hanes

TA's Office Hour: (*in person*)

Tu 12:30-1:30pm

Target Audience: Undergraduate students in STAN major, and any other and is recommended for students throughout the natural and social sciences who are interested in theoretical statistics.

Prerequisites: STOR 435 or equivalent.

Required Text:

- G.A. Young and R.L. Smith, Essentials of statistical inference, Cambridge University Press, 2005, ISBN 0521548667

Optional Text:

- Hogg, R. V., McKean, J., & Craig, A. T. (2005). *Introduction to mathematical statistics*. Pearson Education. ISBN 0321795431

Course Format: Traditional in-person lecture

Course Outline: This course presents introduction to mathematical statistics. Covered topics include elementary decision theory, Bayesian methods, introductory theory of point and interval estimation and hypothesis testing, and introduction to resampling methods. We will pay particular to the mathematical aspects of these topics including some proofs.

Assessment: Your grade will be based midterm exams (30% of the grade), a final exam (40% of the grade), and homework sets (30% of the grade).

Tentative Course Schedule

Date	Topic	Date assignment given (due a week later)
8/22/23	Introduction	
8/24/23	Decision theory 1	Homework 1
8/29/23	Decision theory 2	
8/31/23	Decision theory 3	<i>No homework</i>
9/5/23	NO CLASS (well-being day)	
9/7/23	Bayesian methods 1	Homework 2
9/12/23	Bayesian methods 2	
9/14/23	Bayesian methods 3	Homework 3
9/19/23	Bayesian methods 4	
9/21/23	Bayesian methods 5	Homework 4
9/26/23	Bayesian methods 6	
9/28/23	Bayesian methods 7	Homework 5
10/3/23	Hypothesis testing 1	
10/5/23	Hypothesis testing 2	<i>No homework</i>
10/10/23	Midterm Exam	
10/12/23	Hypothesis testing 3	Homework 6
10/17/23	Hypothesis testing 4	
10/19/23	NO CLASS (Fall break)	<i>No homework</i>
10/24/23	Exponential Family	
10/26/23	Point estimation and sufficiency 1	Homework 7
10/31/23	Point estimation and sufficiency 2	
11/2/23	Confidence sets 1	Homework 8
11/7/23	Confidence sets 2	
11/9/23	Maximum likelihood estimation 1	Homework 9
11/14/23	Maximum likelihood estimation 2	
11/16/23	Predictive Inference 1	Homework 10
11/21/23	Predictive Inference 2	
11/23/23	NO CLASS - Thanksgiving	<i>No homework</i>
11/28/23	Bootstrap 1	
11/30/23	Bootstrap 2	<i>No homework</i>
12/5/23	Review	

Important dates:

- Final Exam: December 9, 8:00 – 11:00AM
- Midterm exam: Tuesday, October 10
- Homework: Homework sets will be usually assigned on Thursdays and due in one week on Gradescope (accessible via Canvas). Late/missed homework will receive a grade of zero unless permission given prior to the due date.

Final Exam: Any student needing to be excused from the final exam due to the 3 Final Exams in 24 hour period rule must bring a written Dean's Excuse and discuss the situation with the instructor at least two weeks prior the end of the semester.

Homework: You are allowed, even encouraged, to work with other students on the homework problems; however, *verbatim copying of homework is absolutely forbidden* and constitutes a violation of the Honor Code. Therefore, each student must ultimately produce his or her own homework to be turned in and graded. You are also encouraged to ask me for help on homework problems after attempting to solve the problems on your own. *No late homework will be accepted without excuse!*

Face Masks Masks continue to be encouraged yet optional in all University buildings. For additional information, see [Carolina Together](#).

Delivery Method This course is classified as “in person”. While I expect you to come in class, I am also planning to accommodate students who are unable to do so by recording and streaming the lectures. The office hours will be held virtually on zoom.

Etiquette for Zoom These are my five expectations of you on Zoom:

- Have your camera turned on.
- Mute your microphone unless answering or asking a question.
- Communicate by unmuting yourself or using the chat feature.
- Be mindful of background noise when not muted.
- Limit your distractions and avoid multi-tasking.

UNC Attendance Policy No right or privilege exists that permits a student to be absent from any class meetings, even online classes, except for these university approved absences: authorized university activities, and disability/religious observance/pregnancy, as required by law and approved by Accessibility Resources and Service and/or the Equal Opportunity and Compliance Office (EOC). 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).

Diversity Statement I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve, I appreciate suggestions.

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 <https://safe.unc.edu>

Honor Code Statement Students are bound by UNC's honor code (<https://studentconduct.unc.edu/information/policies>) in taking exams and in written work, and the submission of said work signifies understanding and acceptance of those requirements. Plagiarism will not be tolerated. Please consult with me if you have any questions about the honor code.

Note: This course will participate in the Carolina Course Evaluation. Each student should feel comfortable approaching the instructor with any concerns he/she has with the course. If there is a concern which cannot be resolved with the instructor or with which the student does not feel comfortable approaching the instructor, you may confidentially contact the Director of Undergraduate Studies at the STOR Department: Prof. Mariana Olvera-Cravioto, 335 Hanes Hall, molvera@email.unc.edu. For all questions on registration, course enrollment and waitlists contact Christine Keat, 321 Hanes Hall, (919) 962-2307, keat@unc.edu.

Legal The instructor reserves the right to make any changes he considers academically advisable. It is your responsibility to attend classes and keep track of the proceedings.