Course Syllabus

NOTE: This is a tentative outline for the course and may be updated based on instructor discretion. Changes may result due to students' progress in the course or changes in instructional priorities.

Teaching Assistant (TA): Yuqi Tian

Schedule:

Lectures and Labs:

- Monday: 11am – 12pm in room 11105 on the 11th floor of 2525 West End
- Wednesday: 11am – 12pm in room 11105 on the 11th floor of 2525 West End
- Friday: 10am -12pm in room 11105 on the 11th floor of 2525 West End

Instructor's Office Hours:

- Monday: 1pm-2pm in room 11116 on the 11th floor of 2525 West End
- Friday: 1pm-2pm in room 11116 on the 11th floor of 2525 West End

TA's Office Hours:

- Wednesday: 3pm-4pm in room 11139 on the 11th floor of 2525 West End

Textbook:

Statistical Inference, Second Edition, George Casella and Roger L. Berger

Homework:

- Assigned weekly or biweekly depending on the flow of the course.
- Tentative due dates are given in the course schedule below but this is subject to change. Any changes will be discussed in class and may not be updated on course website though efforts will be made to update the course website as well.
- It is the students' responsibility to check the due dates of all homework assignments.
- Homework is due at the beginning of class on the date noted.
- You can either email the instructor, cc'ing the TA, a scanned or typed assignment (recommend LaTeX, https://www.latex-project.org, for typed) by the beginning of class on the day it is due or turn in a handwritten assignment at the beginning of class. I am currently working on allowing assignments to be submitted via Brightspace but the TA does not have access to our class at the moment.
- Please contact the instructor via email if you are unable to meet the homework deadline and other arrangements can usually be made.
- Students are encouraged to work together on homework problems, but they must turn in their own write-ups and work independently on exams.

Software:

- Labs and some homework assignments require the R statistical software (https://www.r-project.org and https://www.rstudio.com)

Grading (tentative and grades may be curved depending on student performance)

- Homework/Labs 20%
- Midterm exams 50% (25% each)
- Final Exam 30%

Other Information:

- Students are encouraged to read the corresponding sections in book outside of class.
- Laptops should be brought to the labs on Fridays

Odds and Ends:

- Vanderbilt University has resources available to graduates students for their health (https://www.vumc.org/student-health/) and mental wellbeing (https://www.vanderbilt.edu//ucc/).
- Graduate school calendar: https://gradschool.vanderbilt.edu/academics/calendar.php
- Course site: https://brightspace.vanderbilt.edu/d2l/home/142167

Course Schedule – CHECK BRIGHTSPACE FOR THE MOST UP TO DATE SCHEDULE

Date	Topic	Reading Section(s)	Homework or Lab Due
Aug 21	Introduction and Set Theory	1.1	
Aug 23	Axiomatic Foundations/Calculus of Probabilities	1.2	Lab 1
Aug 26	Counting/Enumerating Outcome	1.2	
Aug 28	Conditional Probability and Independence	1.3	
Aug 30	Conditional Probability and Independence Cont./Discuss Homework 1 questions		Homework 1 Due Lab 2
Sep 2	Labor Day		Work day on homework
Sep 4	Random Variables/Distribution	1.4-1.5	
Sep 6	Random Variables/Distribution Cont.	1.4-1.5	Lab 3
Sep 9	Density and Mass Functions	1.6	
Sep 11	Transformations	2.1	
Sep 13	Transformations Cont.	2.2	Homework 2 Due Lab 4
Sep 16	Expected Values	2.3	
Sep 18	Expected Values Cont.	2.3	

Sep 20	Moments and Moment Generating Functions and Discrete Distributions	2.3,3.1-3.3	Lab 5
Sep 23	Discrete and Continuous Distributions	3.1 -3.3	
Sep 25	Discrete and Continuous Distributions Cont./Review for Exam		Homework 3 Due
Sep 27	Exam		No Lab because of Exam
Sep30	Continuous Distribution	3.3	
Oct 2	Exponential Families /Location and Scale Families	3.4-3.5	
Oct 4	Location and Scale Families/Joint and Marginal Distributions	4.1	Homework 4 Due Lab 6
Oct 7	Joint and Marginal Distributions/Conditional Distributions and Independence	4.2	
Oct 9	Bivariate Transformations	4.3	
Oct 11	Bivariate Transformations Cont.		Homework 5 Due Lab 7
Oct 14	Hierarchical Models and Mixture	4.4	
Oct 16	Covariance and Correlation	4.5	
Oct 18	Covariance and Correlation Cont	4.5	Homework 6 Due Lab 8
Oct 21	Multivariate Distributions	4.6	
Oct 23	Multivariate Distributions cont.	4.6	
Oct 25	Fall Break	4.6	No Lab
Oct 28	Inequalities and Identities	3.6 and 4.7	
Oct 30	Inequalities and Identities Cont./Review for exam	3.6 and 4.7	Homework 7 Due
Nov 1	EXAM		No Lab because of Exam
Nov 4	Random Samples and Sums of Random Variables	5.1-5.2	
Nov 6	Random Samples and Sums of Random Variables/Normal Distribution	5.1-5.3	
Nov 8	Normal Distributions and other Derived Distributions	5.3	Homework 8 Due Lab 9
Nov 11	Summary of Properties of Normal Distribution		
Nov 13	Order Statistics	5.4	
Nov 15	Order Statistics Cont	5.4	Homework 9 Due Lab 10
Nov 18	Convergence Concepts	5.5	
Nov 20	Convergence Concepts Cont	5.5	
Nov 22	Central Limit Theorem	5.5-5.6	Homework 10 Due

			Lab 11
Nov 25	Thanksgiving Break		
Nov 27	Thanksgiving Break		
Nov 29	Thanksgiving Break		No Lab
Dec 2	TBD		
Dec 4	TBD		Homework 11 Due
Dec 6	Final Exam Review (optional)		
Dec 10	Final Exam (1:30pm-3:30pm in large classroom)		