STA 4321/5325
Introduction to Probability/ Fundamentals of Probability
Fall 2025
Course Information and Policies

Objectives: The sequence of courses STA 4321-4322 (rep. 5325-5328) provides a formal and systematic introduction to mathematical statistics for students who have passed three semesters of standard undergraduate level calculus. STA 4321/5325 introduces the background in probability that is necessary to understand the classical statistical theory introduced in STA 4322/5328. Major topics include the basic formal elements of probability, discrete and continuous random variables, multivariate distributions, distributions of functions of random variables, and fundamental limit theorems.

Prerequisite: MAC 2313 (or equivalent third semester calculus course). A well prepared student should have taken an introductory statistics course, such as STA 2023 or STA 3032.

Course Website: All course documents and important information, including suggested homework exercises and readings, will be posted in E-Learning.

Instructor: Kshitij Khare
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Lecture: Monday, Wednesday and Friday, Period 2 (8:30 am – 9:20 am), Anderson Hall, Room 134

Instructor Office Hours: Monday, Wednesday and Friday, 9:30 am – 10:30 am

TA: Hongqiang Sun, Email: sunh1@ufl.edu, Office Hours: Tuesday 4-5 pm, Thursday 3-4 pm (115A Griffin-Floyd Hall)

Required textbook: Dennis D. Wackerley, William Mendenhall III, &
Richard L. Scheaffer, Mathematical Statistics with Applications, 7th Edition, Brooks/Cole, Cengage Learning.

Homework: Appropriate textbook readings and suggested textbook exercises will be posted as the course progresses. You are not expected to submit your answers to the suggested exercises, but you should solve all of them to thoroughly learn the material and best prepare yourself for exams. Though you are allowed to work with other students to solve the suggested exercises and to learn course material in general, please keep in mind that you will be assessed individually. Answers to selected exercises can be found near the end of the textbook, and more complete solutions can be found in the *optional* Student Solutions Manual. Naturally, you will learn best if you attempt to solve the exercises before consulting the solutions.

Quizzes: There will be approximately nine in-class quizzes, typically scheduled for Tuesdays. Each will take place during the final 5 to 10 minutes of class time. No books, notes or other references may be used during a quiz. All quizzes have equal weight for grading, but three of your quiz scores will be dropped – whichever three give you the highest final score in the course, as determined by the instructor. No make-up quizzes will be offered.

Exams: Four within-term exams are tentatively scheduled:

September 17 – Exam 1	October 15 – Exam 2
November 12 – Exam 3	December 3 – Exam 4

Exams will take place in class for the entire class period. Policies and coverage details will be announced prior to the date of each exam. All within-term exams have equal weight for grading, but one of your first three within-term exam scores will be dropped – whichever one gives you the highest final score in the course, as determined by the instructor. The fourth within-term exam on December 3 is compulsory (the exam is not cumulative).

Course Grade: Grading will be based on a composite score: 20% quizzes, 80% within-term exams.

Final letter grades will be assigned on the University's grading scale that includes minus-grades. Please familiarize yourself with the policy related to this scale and the resulting grade point equivalences of letter grades. Details may be found on the following web page:

https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

A grade of incomplete (I) is assigned only in rare cases, such as if you are absent with extenuating circumstances from the final exam. Extenuating circumstances require specific, official documentation (eg. a signed excuse note from the Student Health Care Center). You are eligible for a grade of Incomplete only if you have completed a significant amount of the graded course work and you are currently passing based on that work, as determined by the instructor. If you find that you cannot continue the semester before this point is reached, you should instead seek an administrative withdrawal. As part of receiving a grade on Incomplete, University policy requires you to sign a contract with the instructor that specifies a plan and deadline for completing the course.

Lecture Attendance: Classroom lecture attendance is fully expected, even if not strictly enforced. You are responsible for learning all material presented during lecture, and any topic covered in lecture is a potential exam topic (unless otherwise stated).

Reasonable Accommodations: To request classroom accommodation, please be certain that you have made all necessary arrangements with the Dean of Students Office, and obtain from them documentation to submit to the instructor at the time of your request. A request must be made to the instructor *at least one week in advance* of the date for which the accommodation is requested.

UF Policies: This course complies with all UF policies. For information on those policies and for a list of campus resources, please see this page: https://go.ufl.edu/syllabuspolicies

Daily lecture plan:

Friday, August 22 - Discussion of course policies and Motivation (Suggested Reading Chapter 1 and Section 2.1)

Monday, August 25 - Basic set theory, Sample spaces and events, Formal definition of probability (Suggested Reading Section 2.2 and Section 2.3)

Wednesday, August 27 - Fundamental theorem of counting, Permutations (Suggested Reading Section 2.4)

Friday, August 29 - Counting rules (Suggested Reading Section 2.5)

Wednesday, September 3 - Conditional probability (Suggested Reading Section 3.1)

Friday, September 5 - Inclusion-Exclusion principle, Law of Total Probability, Bayes Rule (Suggested Reading Section 3.2)

Monday, September 8 - Monty Hall problem (Suggested Reading Section 3.3)

Wednesday, September 10 - Random variables, probability mass and distribution functions (Suggested Reading Section 4.1)

Friday, September 12 - Expected values and variance (Suggested Reading Section 4.1)

Monday, September 15 - Chebyshev's theorem (Suggested Reading Section 4.2)

Friday, September 19 - Bernoulli random variables (Suggested Reading Section 4.3)

Monday, September 22 - Binomial and Geometric random variables (Suggested Reading Section 4.4)

Wednesday, September 24 - Negative binomial random variables (Suggested Reading Section 4.5)

Friday, September 26 - Poisson random variables (Suggested Reading Section 4.6)

Monday, September 29 - Hypergeometric random variables (Suggested Reading Section 4.7)

Wednesday, October 1 - Recap and summary of discrete random variables (Suggested Reading Section 4.8)

Friday, October 3 - Continuous random variables, probability density function (Suggested Reading Section 5.1)

Monday, October 6 - Properties of probability density functions (Suggested Reading Section Section 5.1)

Wednesday, October 8 - Expected value and Chebyshev's inequality for continuous random variables (Suggested Reading Section 5.2)

Friday, October 10 - Uniform and Exponential distributions (Suggested Reading Section 5.3)

Monday, October 13 - Gamma distribution (Suggested Reading Section 5.4)

Monday, October 20 - Normal distribution (Suggested Reading Section 5.5)

Wednesday, October 22 - The standard normal CDF (Suggested Reading Section 5.6)

Friday, October 24 - The Beta distribution (Suggested Reading Section 5.7)

Monday, October 27 - The Moment Generating Function and its properties (Suggested Reading Section 5.10)

Wednesday, October 29 - Mixed random variables (Suggested Reading Section 5.11)

Friday, October 31 - Joint mass functions (Suggested Reading Section 6.1)

Monday, November 3 - Joint distribution functions (Suggested Reading Section 6.2)

Wednesday, November 5 - Independent random variables (Suggested Reading Section 6.3)

Friday, November 7 - Probabilities and expectations involving two random variables (Suggested Reading Section 6.3)

Monday, November 10 - General definition of independence, covariance and correlation (Suggested Reading Section 6.4)

Friday, November 14 - Conditional expectations (Suggested Reading Section 6.5)

Monday, November 17 - Multinomial distribution and moment generating functions for sums (Suggested Reading Section 6.6)

Wednesday, November 19 - Distribution of functions of random variables (Suggested Reading Section 7.2 and 7.3)

Friday, November 21 - Method of transformations and conditioning (Suggested Reading Section 7.4 and 7.5)

Monday, December 1 - Method of moment generating functions (Suggested Reading Section 7.6)

This course information and policies sheet can be made available in alternative formats to accommodate print-related disabilities. Contact the instructor for more information.