



STA 4321/5325 (Class number 12288/17438)

Summer A 2025

Introduction to Probability

MTWRF 09:30-10:45 in FLO 100

Instructor: Demetris Athienitis

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Course Website: [e-Learning](#)

Course Delivery: Teaching will be in-person and in-class. Material will be available in e-Learning.

Course Description: The sequence of courses STA 4321-4322 provides a formal and systematic introduction to mathematical statistics. STA 4321 introduces the background in probability that is necessary to understand the classical statistical theory introduced in STA 4322. Major topics include theory of probability, counting rules, conditional probability, independence, additive and multiplicative laws, Bayes Rule. Discrete and continuous random variables, their distributions, moments and moment generating functions. Multivariate probability distributions, independence, covariance. Distributions of functions of random variables, sampling distributions, central limit theorem.

Prerequisite(s): MAC 2313 with minimum grade of C.

Credit Hours: 3

Communication:

- Discussion forum (link to Microsoft Teams available in course website).
- Office hours (posted in e-Learning).
- E-mail for questions regarding course policies. (Ensure that STA **4321** is in the subject line. Failure to do so may result in a non-response.)

Course Objectives

Course Goals and Objectives:

1. Understand and apply foundational concepts of probability theory: calculate probabilities of events using counting rules, conditional probabilities, and independence; apply the additive and multiplicative laws; and use the Law of Total Probability and Bayes' Rule.
2. Calculate and interpret moments and moment generating functions for discrete and continuous random variables; recognize and work with commonly used probability distributions.
3. Analyze multivariate probability distributions: calculate joint, marginal, and conditional distributions; determine independence of random variables; compute expectations, variances, covariances, and correlations; and evaluate linear combinations of random variables.
4. Apply transformation techniques to random variables: use distribution functions, transformation methods, and moment generating functions to find the distribution of a function of random variables; perform bivariate transformations using Jacobians; and compute joint distributions and moments of order statistics.
5. Apply the Central Limit Theorem to approximate distributions of sample means and sums, with emphasis on practical applications in statistical inference.

Materials and Supply Fees

Required Text(s): *Mathematical Statistics with Applications*, 7th Edition

Author(s): D. Wackerly, W. Mendenhall, R.L. Scheaffer; **ISBN-13:** 780495110811

Computational Requirements: Students may need to use R for some computations and L^AT_EX for document typesetting such as homework.

Course Policies

The instructor reserves the right to update parts of this syllabus in the event of extenuating circumstances. Students will promptly be notified of any changes.

Demeanor

All members of the class are expected to follow rules of common courtesy in all classroom discussions, email messages, threaded discussion and chats. Please refer to [expected class netiquette](#) online and during class.

Assignments

- Students are expected to **show and explain their work**.
- Students are allowed to consult any online resources that are deemed relevant, and may consult with other students. However, the work submitted by each student must be **uniquely** theirs. **Offering** and **accepting** solutions - even from textbook - is an act of **plagiarism**, which is a serious offense and **all involved parties will be penalized according to the [UF Student Honor and Conduct Code](#)**. When in doubt, direct your questions to the instructor.

- All **deadlines (excluding exams)** are at **23:59** of the due/end date and posted on course page. These are **hard deadlines** meaning that any open or ongoing assignments will automatically be submitted at the deadline. Assignments are automatically submitted at deadline even if in progress.
- Feedback will be provided within two to five business days from the assignment deadline.

Homework/Quizzes

Under each module in e-Learning,

- **Homework** that are based on (primarily) textbook exercises.
- **Quizzes** that are *timed* and range from conceptual to applied.

All deadlines are posted on e-learning. **Assignments are automatically submitted at deadline even if in progress.**

Exams

There will be two (2) in-class exams that may comprise of multiple choice questions and/or open-ended questions. Exams will emphasize more on conceptual questions. Allowed material:

- Provided formula sheet. Sheet will be provided ahead of time with practise set.
- Scientific/Graphing Calculator. No cell phones.

Important dates: (May be subject to change)

Exam #1	May 30, 09:30
Exam #2	June 20, 09:30

Grading

Grade distribution:

Exams 1, 2	(25% lowest, 35% best)	
Homework	20%	
Quizzes	20%	(includes Intro quiz, lowest quiz dropped)
Total	100%	
Extra Credit	0-1%	(class and discussion forum participation)

Final grade and can be calculated using:

$$\begin{aligned}
 \text{Final} = & 0.25(\text{lowest exam}) + 0.35(\text{best exam}) \\
 & + 0.20 \left(\frac{\sum \text{HW}}{10(\# \text{ of HW})} \times 100 \right) \\
 & + 0.20 \left(\frac{\sum \text{quizzes} - \text{lowest}}{10(\# \text{ of quizzes} - \# \text{ of drops})} \times 100 \right)
 \end{aligned}$$

Letter grade assignment

There will be *no rounding up* of scores.

		A	91 to 100	A-	88 to < 91
B+	84 to < 88	B	80 to < 84	B-	77 to < 80
C+	74 to < 77	C	70 to < 74	C-	67 to < 70
D+	64 to < 67	D	60 to < 64	D-	55 to < 60
E	< 55				

- Final grades are not shown on e-Learning as they do not account for the conditional weighing of exams.
- A minimum grade of C is required for any programs within the Department of Statistics, i.e. majors/minors.
- To view the result of the letter grades to your GPA please visit the [UF Grade and Grading Policies](#).

Make-up

Requirements for class attendance and make-up exams, assignments, and other work in this course as well as policies regarding absences, religious holidays, illness and student athletes are consistent with UF [Attendance Policies](#) and [Examination Policies](#).

Addressing Issues

Technical difficulties

Please contact the UF Help desk via e-Learning “Help” tab. Any requests for make-ups due to technical issues must be accompanied with appropriate documentation/proof including screenshots and communication with the help desk. You **MUST** contact your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Grievances/Commendations

Should you have any grievances or commendations with your experience in this course you can always address them to the instructor (anonymously) or to the Department of Statistics. For issues that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are referred to the Office of the Ombuds.

UF and CLAS Policies

Dropping, Withdrawing and Incomplete

Dropping and Withdraw

For late course drops and course withdrawals check the [catalog](#).

Incomplete

An incomplete grade may be assigned at the discretion of the instructor as an interim grade for a course in which the student has completed a major portion of the course with a passing grade, been unable to complete course requirements before the end of the term because of extenuating circumstances, and obtained agreement from the instructor and arranged for resolution of the incomplete grade in the next term. Instructors are not required to assign incomplete grades. For complete details please visit [CLAS incomplete grade policy and contract](#).

Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the [Disability Resource Center \(DRC\)](#). The DRC will provide documentation to the students who must then provide this documentation to the instructor when requesting information. You must submit this documentation prior to submitting any assignments for which you are requesting accommodation.

U Matter, We Care

[U Matter, We Care](#), through the Dean of Student's Office, offers care related resources and programs focused on health, safety, and holistic well-being.

Academic Misconduct

Students are held accountable to the [UF Student Honor and Conduct Code](#).

Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

1. The email they receive from GatorEvals
2. Their Canvas course menu under GatorEvals
3. The central portal at <https://my-uf1.bluera.com>

Guidance on how to provide constructive feedback is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Tentative Course Outline

Chapter/Week	Content	Textbook
1	Introduction: What is Statistics?	1.1-1.6
2	Probability	2.1-2.13
3	Discrete Random Variables	3.1-3.9, 3.11-3.12
Exam 1		
4	Continuous Random Variables	4.1-4.10, 4.12
5	Multivariate Probability Distributions	5.1-5.9, 5.11-5.12
6	Functions of Random Variables	6.1-6.5, 6.7
Exam 2		