

Course Information

Time: Monday, Wednesday, Friday 1:55 – 2:45 p.m. (Period 7)

Location: Anderson Hall, Room 0134

Instructor: Partha Sarkar

Office: G Flo 209, Griffin Floyd Hall

E-mail: sarkarpartha@ufl.edu

Office Hours: (might change occasionally)(Zoom/ In Person) Wed, Fri 12:00-1:30 pm or by appointment.

Zoom Link: Zoom Link

Teaching Assistant: Swarnali Raha

Office: G Flo 100 A, Griffin Floyd Hall

E-mail: swarnali.raha@ufl.edu

Office Hours: (Zoom/ In Person) Thursday 1-4 pm.

Zoom Link: Zoom Link

Objective

The sequence of courses STA 4321-4322 provides a formal and systematic introduction to mathematical statistics for students who have passed three semesters of standard undergraduate-level calculus. STA 4321 introduces the background in probability that is necessary to understand the classical statistical theory introduced in STA 4322.

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 Contents

- Basic formal elements of probability
- Discrete and continuous random variables
- Multivariate distributions
- Distributions of functions of random variables
- Fundamental limit theorems

Text

- Wackerly, Mendenhall, and Scheaffer, *Mathematical Statistics with Applications* (7th ed), Duxbury Press (Thomson Brooks/Cole Publishing), 2008. Github Download Link(For personal use exclusively, not intended for professional purposes)

Lectures will cover (roughly) chapters 1-7. Note that the exams will be based on material taught in lectures. The textbook is helpful and suggests additional exercises will be assigned from it, but is not strictly mandatory.

Course/Exam modality

The class will primarily be conducted through traditional in-person teaching methods. In unforeseen circumstances, a portion of the classes might transition to an online format. Nevertheless, the instructor will ensure that the mode of instruction will not hinder effective learning, even during emergencies.

Important: **Exams are strictly in-person** and will be proctored by the TA. Exams will take place in class for the entire class period.

Course Website

Canvas course page. Please check the canvas site regularly. Most course documents and important information, including homework exercises and solutions, sample exams, and special announcements, will be posted in Canvas.

Grades & Brief Weekly Schedule

- Three in-class exams (**non-cumulative**) will contribute significantly to the final grade, with the first two exams carrying 25% each and the last exam weighing 30%, totaling 80% of the overall grade. Additionally, there will be approximately 6 quizzes, yet only the 3 lowest scores will be excluded, collectively accounting for 20% of the final grade. The following are tentative grading criteria, subject to potential adjustments throughout the course's progression.

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

Current UF grading policies for assigning grade points can be found [here](#). Note that, the scores shown in Canvas do not account for conditional weightage of exams.

Week	Date	Content
Week 1	01/08 - 01/12	Course Policy, Introduction & Probability axioms
Week 2	01/15 - 01/19	Counting rules & Classical Probability
Week 3	01/22 - 01/26	Conditional Probability, Bayes' Rule and PMF
Week 4	01/29 - 02/02	Expectation & Variance of a Discrete RV, Bernoulli, Binomial Distribution
Week 5	02/05 - 02/09	More Discrete Distributions & MGF of a Discrete RV
Week 6	02/12 - 02/16	MGF & Tchebysheff's theorem & Continuous RV, Exam 1
Week 7	02/19 - 02/23	PDF, Expectation & Variance of a Continuous RV, Uniform Distribution (Cont.)
Week 8	02/26 - 03/01	More Continuous Distributions
Week 9	03/04 - 03/08	More Continuous Distributions & MGF of a continuous RV
Week 10	03/11 - 03/15	Spring Break
Week 11	03/18 - 03/22	Bivariate PMF, Exam 2
Week 12	03/25 - 03/29	Discrete Conditional Distribution, Bivariate PDF
Week 13	04/01 - 04/05	Concept of Covariance & Independence for multiple RVs
Week 14	04/08 - 04/12	Conditional Expectations, Multinomial Distributions
Week 15	04/15 - 04/19	Function of a Discrete and Continuous RV
Week 16	04/22 - 04/26	Central Limit theorem & Exam 3

Exams

- Three in-class (**non-cumulative**) exams are tentatively scheduled:

Exam 1: **Friday, Feb 16** (Covers Lecture 1 to Lecture 16)

Exam 2: **Friday, Mar 22** (Covers Lecture 17 to Lecture 26)

Exam 3: **Monday, April 22** (Covers Lecture 27 to Lecture 36)

- You will be permitted to bring one 8.5 by 11-inch sheet of paper with formulas or notes written on both sides to each exam.
- Only one make-up exam will be offered and you must either let the instructor know well before the scheduled day of the exam which you need to be excused from (for a non-emergency reason), or produce a proof of emergency (or medical problem) as soon after the missed exam as possible.
- **Calculator:** A non-graphing calculator might be used for the exams and quizzes however you will not be penalized for not simplifying terms like $\binom{20}{4}/\binom{30}{6}$

Homework Exercises and Quizzes

- There will be approximately six in-class quizzes, typically scheduled on Friday, based on homework exercises. Each will take place during the final 10 to 15 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 (lowest) quiz scores will be dropped. No make-up quizzes will be offered.

- You are encouraged to discuss homework problems with other students; however, you must answer on your own during the quizzes.
- The instructor and Teaching Assistant make every effort to ensure that grades assigned are scrupulously fair and reflect the quality of the work concerned. Due to this process of consultation and the use of uniform grading criteria, the TA has complete authority in all actions that he undertakes regarding the quizzes, and the instructor is unlikely to rescind any of his decisions.

Suggested Additional Exercises

To master the course material you must work as many exercises as possible. For this reason, homework exercises from the textbook will also be posted on the course web page regularly. You are not expected to submit answers to these suggested exercises, but you should solve all of them to keep up with the pace of the course and thoroughly learn the material. This will also help you prepare for the exams.

Lecture Attendance

Classroom lecture attendance is fully expected, even if not strictly enforced. You are responsible for learning all material presented during the lecture, and any topic covered 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. This course information and policies sheet can be made available in alternative formats to accommodate print-related disabilities. Contact the instructor for more information.

Course Evaluations

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Academic Integrity

Please familiarize yourself with the Student Honor Code and Academic Honesty Guidelines outlined in your University of Florida Student Guide at [this link](#).