

STA 4321, Section U01 (Class Ref # 81233), Fall 2025, Main Session (16 Weeks)

Introduction to Mathematical Statistics, I

Campus: MMC

Days: Mondays and Wednesdays

Time: 2:00 PM - 3:15 PM

Classroom: PC 428

Credit Hours: 3

Course Modality: F2F (Class-Lectures)

Course Syllabus & Policies Outlines

Prerequisite:

MAC 2313 (Calculus III) & Basic Knowledge of Using the Internet and Canvas

Professor Information:

Dr. H. Zahedi

Office: DM 405, MMC

Phone: (305)348-2927

Emai: zahedih@fiu.edu

Webpage: <https://faculty.fiu.edu/~zahedih>

Canvas Login: <https://canvas.fiu.edu>

Office Hours:

Mondays and Wednesdays: 3:30PM – 4:50PM (No appointments needed)

Other Times and Days: By appointments subject to availability

Feel free to consult me as often as you need, and whenever a problem arises.

Policies & Resources:

- All FIU students enrolled in the class must have a valid FIU (picture) ID card and be ready to show the ID at the professor's request (for example, when taking the exams.) Also note that all FIU students should use FIU email to communicate with the professor.
- This is a Web Assisted Course using Canvas. Students enrolled in this course are expected to have a Valid FIU Email Account and be familiar with the basics of internet use. Note, this is neither online nor a remote teaching course. The purpose of web-based materials is to enhance and complement the classroom's lectures and the textbook, to post review notes and formulas, and to do web-based review-quizzes on Canvas environments and to facilitate and enhance learning and teaching. Canvas materials are not intended to substitute the class lectures; and students are expected to attend classes regularly.
- Exams are based on all materials covered and discussed in lectures, assignments, possible review quizzes and projects. Students are strongly advised to attend all class lectures, and to be on time. No late Assignments will be Accepted.
- Anyone who misses any exam/ or a possible review quiz will receive an F (score of 0) for that exam/ or that quiz.
- Makeup for an exam or quiz will be given only if the student misses the or the quiz due to those emergency cases which meet all the University's requirements for makeup, such as the student's illness. See the FIU students' handbook for details.
- Failure to complete and submit any graded review quiz or a graded assignment within its deadline would result in an F (score of 0) grade for that review quiz or assignment.
- No active Beepers, Cellular phones or any other Smart Medias are allowed during exams. Students are expected to silence their cell phones during the class lectures.
- You may use AI programs such as ChatGPT to help you understand the technical words and concepts used in Statistical fields (Applied Statistical, Probability and Mathematical Statistical, Statistical Analysis Commonly Used in Engineering and Computer Science such as Statistical Reliability Modeling and Analysis). But you should realize materials generated by AI programs could be inaccurate, incomplete or completely wrong. In addition, the frequent use of AI programs will negatively impact your own analytical thinking process. In this course you should not submit any Completed Chapter Review Assignments or Chapter Review Quizzes that are done and generated by AI Programs or copied from other individuals. If you submit materials generated by an AI program or copied from others, it would be considered plagiarism and cheating and it will be dealt with strongly, under FIU Policies for Plagiarisms.

Student Conduct and Academic Integrity

Promoting community, civility, and accountability

The Office of Student Conduct and Academic Integrity (SCAI), works to ensure that FIU is a “safe and stimulating environment in which scholarship and personal growth may occur.” (Code, pg. 1). SCAI is tasked with administering the application of FIU Regulation 2501, the Student Conduct and Honor Code (Code) in a fair and developmental manner. Through the application of the Code, the safety and growth of community members is protected, and the integrity of an FIU degree is preserved. The detailed information about student conduct and academic integrity is available here:

<https://dasa.fiu.edu/all-departments/student-conduct-and-academic-integrity/index.html>

Core Principles of this Course

This course will serve to embrace the diversity and inclusivity found within Florida International University. We appreciate and respect diversity, equality, equity, cooperativeness, community, and sustainability within our online courses. We are committed to the ongoing education of our students and their participation within the course regardless of gender, ethnicity, age, sexual orientation, geographical location, religion, and disability. We strive in encouraging collaboration by preparing our students to value the differences in others. At the core of our intentions is the encouragement of acceptance and appreciation of differences within our student population and community.

Nondiscrimination Statement

The Office of Civil Rights Compliance and Accessibility (CRCA) is responsible for ensuring that FIU maintains a workplace and learning environment free from discrimination, where current and prospective faculty, staff, and students are treated equitably. If any student, employee, or applicant has a sincere and reasonable belief that they have been discriminated against or harassed based on age, color, disability, gender, marital status, ethnic or national origin, race, religion, retaliation, sex, or any other protected category, they can report their concerns to the CRCA team through: <https://report.fiu.edu/>

Textbook:

"Mathematical Statistics with Applications" by Wackerly, Mendenhall, and Scheaffer, 7th edition, Duxbury.

Coverage & Objectives:

We will cover most of the topics in chapters 1-7, plus some additional related topics in the form of class notes. This is the first of the two most fundamental undergraduate, calculus based, courses in probability theory and mathematical statistics which are required for all our undergraduate Statistics Majors. The emphasis of this course is on basic probability concepts and distribution theory, which are the foundation of mathematical statistics. This includes the following topics: introduction to statistics, sample space and probability, discrete random variables and their probability distributions, continuous random variable, and their distributions, multivariate (mainly bivariate) probability distributions, functions of random variables and probability integral transformation, sampling distributions and the central limit theorem. (See the course syllabus on the second page for more details.)

Assignments:

Weekly Homework (about 8 to 12 problems each). (See the list of the suggested problems on Canvas.)

Tentative Exams:

Quizzes: TBA (Could be online on Canvas)

Exam I: Wednesday, September 24, 2:00PM – 2:15PM

Exam II: Wednesday, October 29, 2:00PM – 3:15PM

Final Exam: Wednesday, December 10, 2025, 12:00Noon – 2:00PM, CASE 135

** You should not register for courses that have examinations conflicts with this course.*

Grading Scheme:

5% Attendance,

20% Chapters' Review Assignments & possible Quizzes,

25% Exam I,

25% Exam II,

25% Final Exam.

Approximate Grade Scaling:

[93 - 100] A, [90 - 93) A-,

[85 - 90) B+, [80 - 85) B, [75 - 80) B-

[70 - 75) C+, [60 - 70) C,

[50- 60) D,

[0 - 50) F

Note: Anyone who does not take the final exam could receive an F for the course

Some Important Dates (Fall 2025 16 weeks)

Classes Start:	Monday, August 25, 2025
Last Day to Add/Drop:	Sunday, August 31, 2025
Labor Day (No Classes):	Monday, September 1, 2025
Last Day to Drop with a DR Grade:	Monday, November 3, 2025
Veterans Day (No Classes):	Tuesday November 11, 2025
Thanksgiving Holiday Break (No Classes):	Wednesday–Sunday, Nov. 26-30, 2025
Last Regular Class Day:	Saturday December 6, 2025
*Finals Week (Required Class Meetings):	Monday-Saturday, Dec. 8-13, 2025
End of Term:	Saturday December 13, 2025
Commencement:	Monday-Thursday, Dec. 15-18, 2025
Grades Available for Students:	Thursday December 18, 2025

**If a final exam is not required, classes are expected to be held during finals week*

For further information and other important dates please visit:

https://onestop.fiu.edu/_assets/calendars/2025-2026-academic-calendar-rev-dmb-11-19-2024.pdf know-your-dates.pdf

Note: The course outline is subject to possible changes, and in case of any changes, you will be notified in advance.

STA 4321

INTRODUCTION TO MATHEMATICAL STATISTICS, I

COURSE SYLLABUS

Prerequisites:

MAC 2313 (Calculus III)

Textbook:

"Mathematical Statistics with Applications" by Wackerly, Mendenhall, and Scheaffer, 7-th edition, 2008, Brooks/Cole, Cengage Learning

1. What is statistics

Introduction, Characterizing A set of Measurements: Graphical and Numerical Methods, How Inference Are Made, Theory and Reality, Summary

2. Probability

Introduction, Probability and Inference, Review of Set Notations, A Probability Model for an Experiment (Discrete Case), Calculating the Prob ability of an Event (The Sample Point Method), Tools for Counting Sample Points (Some Combinatorial Rules), Conditional Probability and the Independence of Events, Two Laws of Probability, Calculating the Probability of an Event: the Event-Composition Method, Inclusion-Exclusion Law, The Law of Total Probability and Bayes ' Rule, Numerical Events and Random Variables, Random sampling Summary.

3. Discrete Random variables and Their Probability distributions

Basic Definition, The Probability Distribution for a Discrete Random Variable, The Expected Value of a Random Variable or a function of a Random Variable, The Bernoulli, Binomial, Geometric, Negative Binomial, Hypergeometric and Poisson Probability Distributions, Moments and Moment generating Functions, Probability Generating Function (Optional), Tchebysheff's Theorem, Summary

4. Continuous random variables and Their Probability Distributions

Introduction, The Probability Distribution for a Continuous Random Variable, Expected Values for continuous Random Variables, The Uniform, Normal, Gamma & Gamma Related (Exponential, Chi-Squared, Weibull) and Beta Probability Distribution Functions, Some General Comments, (The Moments and Moment Generating Function for a Continuous Random Variable), Other Expected Values, Tchebysheff's theorem, Expectations of Discontinuous and Mixed Probability Distributions (Optional).

5. Multivariate Probability Distributions (Main Emphasis on Bivariate Case)

Introduction, Bivariate and Multivariate Probability Distributions, Marginal and Conditional Probability Distributions, Independent Random Variables, the Expected Value of a Function of Random Variables, Special Theorems, The Covariance and Correlation of Two Random Variables, The Expected Value and Variance of a Linear Functions of Random Variables, The Multinomial Probability Distribution, The Bivariate Normal Distribution (Optional), Conditional Expectations, Summary.

6. Functions of Random Variables

Introduction, Finding the Probability Distribution of a Function of Random Variables, The Method of Distribution Functions, The Method of Transformations, The Method of Moment Generating Functions, Multivariable Transformations Using Jacobians (Optional), Order Statistics, Summary

7. Sampling Distributions and the Central Limit Theorem

Introduction, Sampling Distributions Related to the Normal Distribution, The Central Limit Theorem, A Proof of the Central Limit Theorem, The Normal Approximation to the Binomial Distribution, (Comments & Summary.)

Suggested Homework Problems from the Textbook: TBA on Canvas