STA4321U01 (Class Ref # 12354), Spring 2025, Main Session (16 Weeks)
Introduction to Mathematical Statistics, I
Course Syllabus & Policies Outlines

Days: Mondays and Wednesdays
Time: 2:00 PM - 3:15 PM
Classroom: PC 425
Credit Hours: 3

Modality: F2F (In-Person, Class Lectures)

Prerequisite: Calculus III (MAC 2313 or any equivalence) & Basic Knowledge of Using Internet

Instructor: Dr. H. Zahedi

Formal Office hours:

Mondays and Wednesdays: 4:00 PM - 4:50 PM & 6:30 PM - 7:00 PM (no appointments required)
Fridays: 10:30AM - 10:55AM (No Appointment Required)
Other Times and Days: By appointments subject to availability
Office: DM 405
Email: zahedih@fiu.edu
Feel free to consult with me as often as you need and whenever problems arise.

Important Comment About the Course*:*

This is face-to-face course offered on MMC and requires students to attend classes regularly. There will be no simultaneous Zoom classes or recording of the lectures. You should take this course if you intend and are able to attend classes in regular basis.

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

References only if Needed:

1. Mathematical Statistics by Freund,
2. Introduction to Mathematical Statistics by Hoel,
3. Probability and Statistics by DeGroot.

Coverage & Objectives:

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 last page for more details.)**

Assignments:

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

Tentative Exams:

Exam I: Wednesday, February 5
Exam II: Wednesday, March 19
Final Exam: Wednesday, April 23, 12:00 PM - 2:00 PM

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

Grading:

20% Assignments, 5% attendance, **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

Course Policies & Remarks:

1. 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.)

2. 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 an online nor a remote teaching course. The purpose of web-based materials is to enhance and complement the class lectures and textbook, to post review notes and formulas, and to do possible web-based review quizzes on Canvas environments to facilitate and enhance learning and teaching. Canvas materials **are not intended to substitute the classroom lectures and students are expected to attend in-person class sessions regularly.**

3. 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.

4. Anyone who misses any exam/ or a possible review quiz will receive an F (score of 0) for that exam/ or quiz.

5. 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 a makeup, such as the student's illness. See the FIU students' handbook for details.

6. Failure to complete and submit any graded review quiz or a graded assignment withing its deadline would result in an F (score of 0) grade for that review quiz or assignment.

7. No active Beepers, Cellular phones or any other Smart Media are allowed during exams. Students are expected to turn off their cell phones during the class lectures.

8. Academic Misconduct: Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of

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ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook. **The Following Statement is Required by the University:** Plagiarism and cheating are serious offensive punishable by expulsion from the university.

9. Student Honesty Statement:
FIU defines academic misconduct in the Student Conduct and Honor Code (Code) as, "any act or omission by a student, which violates the concept of academic integrity and undermines the academic mission of University in violation of the Code." Code violations include, but are not limited to academic dishonesty, bribery, cheating, commercial use, complicity, falsification, and plagiarism. The codes are available here:
https://studentaffairs.fiu.edu/get-support/student-conduct-and-academic-integrity/student-conduct-and-honor-code/ index.php.

Some Important Dates for Main Session:

January 6 Monday:	***Classes Start***
January 13, Monday:	***Last day to Add/Drop Courses or Withdraw from the University without Incurring Financial Liability for Tuition & Fees***
January 20 Monday:	***Martin Luther King Day (Holiday, Closed).***
February 24–March 1:	***Spring Break (University open, no classes)***
March 17, Nonday:	***Last Day to Drop a Course with a DR Grade and/or Withdraw from the University with a WI Grade***
April 19, Saturday:	***Last Regular Class Day***
April 21 - April 26:	***Finals week - modified class schedule: (Final Exams and other course assessment activities are scheduled during this week.) * *If a final exam is not required, classes are expected to be held during finals week***
Saturday, April 26:	***Last day of Classes and Exams***
Thursday, May 1:	***Grades Post (Available at my.fiu.edu)***

For further information and other important dates please visit the Florida International University's Home Page at http://www.fiu.edu .

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

STA4321 (Introduction to Mathematical statistics, I)
COURSE SYLLABUS

Prerequisites:

MAC 2313 (Calculus III)

Text:

"Mathematical Statistics with Applications" by Wackerly, Mendenhall, and Scheaffer, 7th 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, (Some Comments), Summary.

Suggested Homework Problems From the Textbook: TBA