STA 3033, Section U01, Class Ref # 51368, Credit Hours: 3

Introduction to Probability & Statistics for CS and Engineering

Summer A, May 6, 2024 – June 14, 2024

Time: 3:15:00 PM – 4:50 PM
Days: MoTuWeTh
Room: PC331

Prerequisite:

Calculus II (MAC 2312 or any equivalence) & Basic Knowledge of Using Internet and Canvas

Short Course Policies and Syllabus Outlines

Instructor:
Dr. Zahedi
Office: DM405
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Canvas login: https://canvas.fiu.edu/

Formal Office hours:

Mondays, Tuesdays, Wednesdays and Thursdays :
    2:00 PM – 3:00 PM (no appointments required for these hours)
Other Times and Days:
    By appointments, subject to times availability
Feel free to consult with me as often as you need and whenever problems arise.

Important Remarks About This FTF (fae-to-face) Course

1.   This is an in-person (face-to-face) course and requires that you attend all classes regularly. There will be no simultaneous Zoom classes or recording of the lectures. Missing even one day of class is equivalent to missing one hour and 50 minutes of class time. You should take this Summer A course only if you intend and are able to attend in person class lectures and keep up with the fast pace of the course.

2.   Also note that the STA 3033 is a calculus-based course and could be a somewhat challenging course for some students, even in a regular long semester which has a slower pace, especially for those students with a rusty background on the basic working knowledge of Calculus I and II courses. Please make sure that you can afford to commit the necessary times and the efforts needed for the course in the short summer A semester. Otherwise, it will be better to take this course in a regular long semester in a Fall or a Spring semester.

3.   In case of an emergency such as re-surge of Covid19 Pandemic that the university had to close and cancel all the F2F courses offered in Campus, we will then continue the course remotely using the Zoom and Canvas at the same scheduled times for lectures, Office hours. . ., etc. In that case all communication with the professor will be via FIU Emails, Canvas and Zoom.

4.   Also note that all FIU Students must use FIU Email to communicate with the professor.

Textbook:
   "Probability and Statistics for Engineers" by J. Devore, 9th edition 2016, Cengage Learning. The Book package deal comes with some additional course materials for students.

Coverage & Objectives:
   We will cover most of the topics in chapters 1, 2, 3, 4, 5 (only sections 5.3 and 5.4), 6, 7, 8 plus some additional related topics in the form of class notes. This is an introductory, calculus based, undergraduate course in basic probability and statistical inference based on a single variable for Computer Science and Engineering Majors. The course is intended to teach these students some basic ideas and techniques in descriptive statistical analysis, random events, and probabilities, commonly used univariate discrete and continuous probability models, statistics, sampling distributions, point estimations, interval estimations, and testing hypotheses for some most used parameters. For more details, please see the included short course syllabus at the end and read the Introduction for each covered Chapters which are posted on the Canvas.

Assignments:
   Weekly Review Assignments and Recommended Homework Problems from the textbook. See the list of suggested homework problems from the textbook and other supporting materials on Canvas.

Tentative Exams:

Quizzes: **TBA (Some will be on Canvas)**

Midterm Exam: **Thursday, May 30, 2024**

Final Exam*:   **Thursday, June 13, 2024**

 ***You should not register for courses that have a final examination conflict with this course.**

Grading:
   5% for Full Attendance, 15 % Chapters' Review Assignments, 20% Quizzes, 30% Midterm Exam; 30 % Final Exam.

Approximate Grade Scaling for those who have taken both Midterm and the Final Exams:
   [93 - 100] A   [90 – 93] A-   [85 – 89] B+   [80 – 84] 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) Panther ID card and be ready to show the ID at 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 and Canvas 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 the textbook, to post review notes and formulas, to do possible web-based review quizzes on Canvas environments, and 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.

Make-up for an exam or a quiz will be given only if the student misses the exam or the quiz due to those emergency cases which meet all the University's requirements for a make-up exam, such as the student illness. See the FIU students' handbook for details!

5. 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.

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

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

8. Student Honesty Statement Statements:
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 code is available online at:

https://studentaffairs.fiu.edu/get-support/student-conduct-and-academic-integrity/student-conduct-and-honor-code/index.php.

Some Important Dates:

May 6, Monday :	**Classes Begin**
May 13 Monday	**Last day to add/drop or withdraw from University without incurring liability for tuition and fees**
May 19 Friday:	**Last day to withdraw from University with 25% refund of tuition**
May 27 Monday:	**Memorial Day Holiday (No Classes)**
June 3 Monday:	**Last day to drop a course with a DR grade or withdraw from the University with a WI grade.**
June 14 Friday:	**Last Regular Class Day**
June 20 Thursday:	**Grades Available for Students on the 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.*

STA 3033 (Intro. To Probability & Statistics For CS and Engineering)
Course Syllabus (Summer 2024)
Prerequisite: Calculus II; **Terms Offered:** Fall, Spring and Summer

Current Textbook:
Probability and Statistics for Engineers, by Jay L. Devore, 9h edition, Cengage Learning.

Other Optional Reading if needed:
1. "Probability and Statistics For Engineering and Sciences" by Schaeffer, Mulekar, McClave, 5th edition
2. "Probability and Statistics in the Engineering and Computer Sciences", by J.S. Milton and J.C. Arnold.

Topics Coverage:

Overview and Descriptive Statistics:
Introduction, Basic ideas and tools for summarizing, displaying and analyzing data sets. Populations, Samples and
Processes, Pictorial and Tabular Methods in Descriptive Statistics, Measurers of Locations, Measures of Variability, Other measures. (Approximately 1.5*) **Probability:**
Introduction, Sample Spaces and Events, Axioms, Interpretations and Properties of Probability, Counting Techniques, Conditional Probability, Independence. (Approximately 2 weeks*)

Discrete Random Variables and Probability Distributions:
Introducing, Concepts of a Random Variable, Probability Distributions for Discrete Random Variables, Cumulative Distribution Function, Expected Values, The Bernoulli and Binomial Distributions, Geometric Distribution, Negative Binomial Distribution, Poisson Distribution, Hypergeometric Distribution. (Approximately 2 Weeks*)

Continuous Random Variables and Probability Distributions:
Introduction, Probability Density Functions, Cumulative Distribution Functions; Expected Values, The Normal Distribution, The Exponential and Gamma Distributions, Other Contiguous Distributions (such as Beta Distribution, Weibull Distribution, Probability Plots) (Approximately 2 weeks*)

Statistics and Sampling Distributions:
Introduction, Statistics and Their Distributions, The Distribution of the Sample Mean (Additional Topics: Sampling Distribution of a Sample Variance, Central Limit Theorem, Normal Approximation to the Binomial Distribution). (Approximately 1.5 week*)

Point Estimation:
Introduction, Some General Concepts of Point Estimation (Unbiasedness, Consistency, Minimum Variance Estimators, ...etc.) (Approximately 1.5 Weeks*)

Statistical Intervals Based on a Single Sample:
Introduction, Interval Estimators, Basic Properties of Confidence Intervals, Large-Sample confidence Internals for a population Mean and Proportion, Confidence Intervals Based on a Normal Population Distribution, Confidence Interval for the Variance and Standard Deviation of a Normal Population, (Some other Common Confidence Intervals)

Tests of Hypothesis Based on a Single Sample:
Introduction, Hypothesis and Test Procedures, Z-Tests for Hypotheses about a population Mean, One Sample T-Test, Tests Concerning a Population Proportion

Inferences (Tests of hypotheses and Confidence Internals) Based on Two Samples
Z Tests and Confidence Interval for a Difference Between Two Population Means, Two Sample T Tests and Confidence Intervals for Difference between Two Population Means, Analysis of Paired Data, Inference Concerning a Difference Between Two Population Proportions, Inference Concerning two Population Variances, Testing about the Mean, the Proportion , The Variance, the Difference between

two Means, the Difference Between Two Proportions, Paired T-Test, and Testing the Ratio of Variances. (Approximately 1.5 Weeks*)

* Important Remark: The approximate times in weeks that are listed for each topic is intended for the course when it is offered in a regular semester which has half of contact hours per week than the short semester such as Summer A. In a short semester such as Summer A or Summer B, which meets twice as many hours per week than the regular long semester such as summer C, the amount of the times in weeks per chapter will be about half of the listed times.