Number:	**STAT/CS/SE 3341**
Title:	**Probability and Statistics in Computer Science and Software Engineering**
Term:	Spring 2024

Instructor Information

Name:	**Octavious Smiley**, Assistant Professor of Instruction
Email:	`Octavious.Smiley@UTDallas.edu`
Office:	FN 3.118B
Hours:	Wednesday 1-2pm

Teaching Assistant Information

Name:	**Afser Uddin**
Email:	`Mohammadafser.Uddin@utdallas.edu`
Tutoring:	The Student Success Center Peer Tutoring program is offering drop-in tutoring (but not one-on-one appointments) for the Spring'24 semester.

Course Information

Pre-requisite:	(MATH 1326 or MATH 2414 or MATH 2419), and (CE 2305 or CS 2305)
Description:	Axiomatic probability theory, independence, conditional probability. Discrete and continuous random variables, special distributions of importance, and expectation. Simulation of random variables and Monte Carlo methods. Central limit theorem. Basic statistical inference, parameter estimation, hypothesis testing, and linear regression. Introduction to stochastic processes.
Required text:	*Probability and Statistics for Computer Scientists, 2nd edition* by Michael Baron
Non-required text:	*Probability and Statistics* by Morris H. DeGroot, *Probability and Statistics: The Science of Uncertainty* by Michael J. Evans (The answers are in the back of the book)

Learning Outcomes

Probability:	• Apply the fundamental probability rules and concepts. • Apply common discrete and continuous probability distributions. • Relate calculus to probability to solve probability problems. • Learn the basics of stochastic processes and its classical applications.
Statistics:	• Understand common numerical summaries and exploratory analyses of data. • Choose the appropriate statistical analysis method to answer a typical statistical question. • Construct confidence intervals and perform tests of signicance to make statistical inferences.

Grading Policies

Summary:

- **30**%: Homework
- **20**%: Quiz
- **25**%: Exam 1
- **25**%: Exam 2

Homework:

- Individual-based
- Must submit a pdf document
- Submit to eLearning
- Late homework will be rejected
- Two lowest homework scores will be extra credit
- Each homework has 10 points

Quiz:

- Individual-based
- Open Notes (Including internet)
- Pass/Fail (50% or more to pass)
- Multiple Choice
- Lowest 3 will be dropped
- Must be in class to take quiz
- Pop quizzes are possible
- No make-ups under any circumstance

Exam:	• Individual-based • One side of 3x5 NoteCard per exam • Free response • In-class • If exam average is higher than quiz average, it will replace the quiz average

Grading Criteria

Grade	Percentage Range
A+	[97, 100+)
A	[90, 97)
B+	[87, 90)
B	[80, 87)
C+	[70, 80)
C	[60, 70)
D+	[50, 60)
D	[40, 50)

Course Schedule (Tentative)

Week	Topic	Chapter
1	Course overview + probability basics	2
2	Rules of probability	2
2	Conditional Probability and Independence	2
3	Law of Total Probability and Bayes Rule	2
3	Introduction to random variables	3
4	Discrete Random Variables (R.V.), Combinatorics	3
4	Bernoulli & Binomial R.V.	3
5	Geometric & Poisson R.V.	3
5	Continuous R.V. & Uniform R.V.	4
6	Exponential and Gamma R.V.	4
6	Normal R.V.	4
7	Normal R.V. & Central Limit Theorem	4
7	Review for Exam #1	
8	Exam #1	
8	Intro to Stochastic Processes	5
9	Spring break	
10	Stochastic Processes	5
10	Intro to Statistics	8
11	Intro to Statistics	8
11	Point Estimation	9
12	Point Estimation	9
12	Confidence Intervals for Proportions	9
13	Confidence Intervals for Means & t-distribution	9
13	Intro to Hypothesis Testing	9
14	Significance Tests: Means	9
14	Significance Tests: Proportions	9
15	Significance Tests: Categorical Data	10
15	Linear Regression	11
16	Linear Regression	11
16	Review for Exam #2	
16	Exam #2	

Course Policies

Electronic devices:	Calculators are permitted for exams, but not cell phones, computers, tablets, etc. Limit the use of all devices during class.
Make-up exams:	No make-up chance will be granted unless there is a serious illness and family emergencies, with the appropriate documentation provided in a timely manner.
Late work:	No late homework will be accepted.
Special assignments:	No special assignment is available.
Class attendance:	Although attendance is not mandatory, you are encouraged not to miss any class as the course will move at a fast pace. The instructor will not make any accommodations for missing a class.
Comet Creed:	This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: "As a Comet, I pledge honesty, integrity, and service in all that I do."
UT Dallas syllabus policies and procedures:	The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for those policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the instructor.