Course:	**STAT/CS/SE 3341.006**
Title:	**Probability and Statistics in Computer Science and Software Engineering**
Term:	Fall 2022
Hours:	Monday & Wednesday, 1:00 – 2:15pm
Classroom:	SCI 1.210

Instructor Information

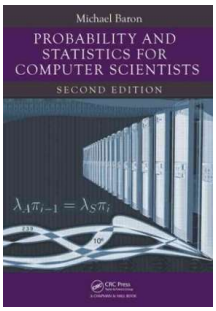
Name:	**Kevin Lutz**, Teaching Associate of Statistics and PhD Candidate
Email:	`kevin.lutz@UTDallas.edu`
Office:	Microsoft Teams
Hours:	Tuesday, 2:00 – 3:00pm or by appointment.

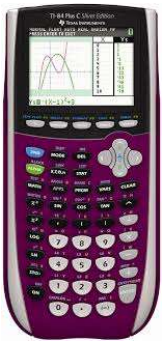
Teaching Assistant Information

Name:	Ibrahim Sajal
Email:	`IbrahimHossain.Sajal@UTDallas.edu`
Office:	TBD
Hours:	TBD

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.
Nonrequired text:	*Probability and Statistics for Computer Scientists, 2nd edition* by Michael Baron
Calculator:	TI84 graphing calculator (or equivalent) is required (no phones or other devices permitted during exams)





Learning Objectives

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 significance to make statistical inferences.

Grading Policies

Summary:
- **30**%: Homework
- **10**%: Quizzes
- **30**%: Exam #1
- **30**%: Exam #2

Homework:
- Assigned on Wednesday and due by 11:59 pm on Monday; some HW will be completed online and some HW will be written. All work is submitted via eLearning.
- Two homework assignments will be counted as extra credit. If you do not complete them, then consider these two assignments as dropped. As a result, no extensions or make ups will be permitted.
- Students are encouraged to collaborate on homework problems, but what you turn in should reflect your own effort.

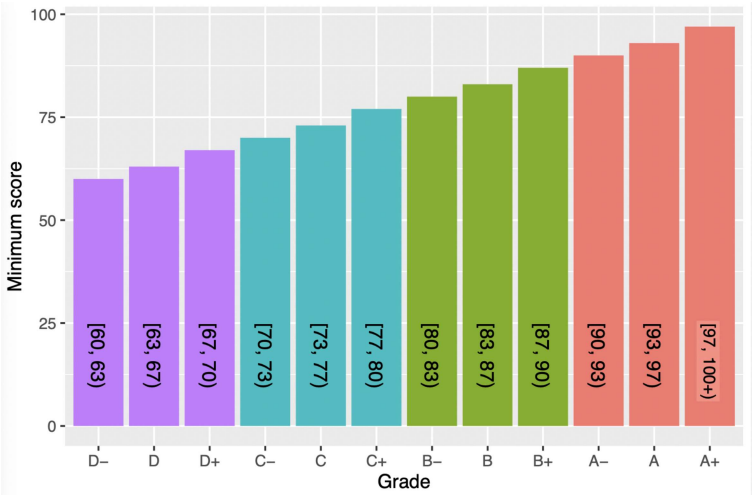
Quizzes:
- Graded on a pass/fail basis (pass = score of 50% or higher).
- Given in class *unannounced* but completed online (eLearning) with limited time.
- No calculator necessary; basic concepts or activities only.
- One quiz grade will be dropped, so no make-ups allowed.

Exams:
- Given in class only. No exceptions.
- Exams will be free response and graded with partial credit.
- Calculator is permitted. No devices with wifi.
- Closed book, closed notes.
- Missing an exam results in a grade of zero.
- Dates:
  - Exam #1 (Oct 12): Topics from weeks 1-7.
  - Exam #2 (Dec 7): Topics from weeks 9-15.

Course Schedule (Tentative)

Week	Date	Topic	Chapter	Due
1	Aug 22	Course overview + probability basics	2	
1	Aug 24	Probability of Unions and Intersections	2	
2	Aug 29	Conditional Probability and Independence	2	HW1
2	Aug 31	Law of Total Probability and Bayes Rule	2	
3	Sep 5	*Labor Day Holiday - no classes* *HW2 is due Tuesday, Sep 6 because of the holiday.*	-	HW2
3	Sep 7	Discrete Random Variables (R.V.), Combinatorics	3	
4	Sep 12	Bernoulli & Binomial R.V.	3	HW3
4	Sep 14	Geometric & Poisson R.V.	3	
5	Sep 19	Continuous R.V. & Uniform R.V.	4	HW4
5	Sep 21	Exponential and Gamma R.V.	4	
6	Sep 26	Normal R.V.	4	HW5
6	Sep 28	Normal R.V. & Central Limit Theorem	4	
7	Oct 3	Intro to Stochastic Processes	5	HW6
7	Oct 5	Stochastic Processes	5	
8	Oct 10	Review for Exam #1	-	HW7
8	Oct 12	**Exam #1**	-	
9	Oct 17	Intro to Statistics	8	
9	Oct 19	Intro to Statistics	8	
10	Oct 24	Point Estimation	9	HW8
10	Oct 26	Point Estimation	9	
11	Oct 31	Confidence Intervals for Proportions	9	HW9
11	Nov 2	Confidence Intervals for Means & t-distribution	9	
12	Nov 7	Intro to Hypothesis Testing	9	HW10
12	Nov 9	Significance Tests: Means	9	
13	Nov 14	Significance Tests: Proportions	9	HW11
13	Nov 16	Significance Tests: Categorical Data	10	
14	Nov 21	*Fall Break - no classes*	-	
14	Nov 23	*Fall Break - no classes*	-	
15	Nov 28	Linear Regression	11	HW12
15	Nov 30	Linear Regression	11	
16	Dec 5	Review for Exam #2	-	
16	Dec 7	**Exam #2**	-	

Grading Criteria



Course Policies

Modality:	In-person only unless official changes are made by UTD.
eLearning:	Course notes, announcements, assignments, etc., will posted weekly. It is suggested that you check eLearning and your school email on a daily basis to stay up-to-date.
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:	If you know ahead of time that you will be missing an exam, you must contact the course instructor by email at least 4 days in advance of the scheduled exam. Be prepared to bring appropriate documentation as evidence in support of your request.
Late homework:	Not accepted.
Class attendance:	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. Those who do not attend class regularly are inviting scholastic difficulty. *"By failing to prepare, you are preparing to fail."* - Benjamin Franklin
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 link constitutes the University's policies and procedures of the 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.