Course:	**STAT/CS/SE 3341.002**
Title:	**Probability and Statistics in Computer Science and Software Engineering**
Term:	Spring 2023
Hours:	Tuesday & Thursday, 2:30pm – 3:45pm
Classroom:	ECSS 2.410

Instructor Information

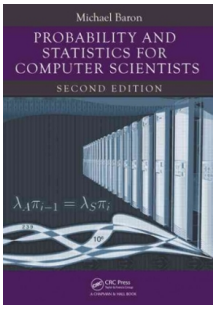
Name:	**Kevin Lutz**, Teaching Associate of Statistics and PhD Candidate
Email:	`kevin.lutz@UTDallas.edu`
Office Hours:	By appointment only

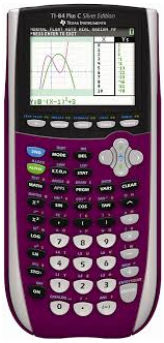
Teaching Assistant Information

Name:	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/graphs 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:
- **25**%: Homework
- **37.5**%: Exam #1
- **37.5**%: Exam #2

Homework:
- 13 assignments total

(1) Written and graded by the TA: HW5,7,9,10,11,12 (6 total)

(2) Online/graded automatically in eLearning: HW1,2,3,4,6,8,13 (7 total)

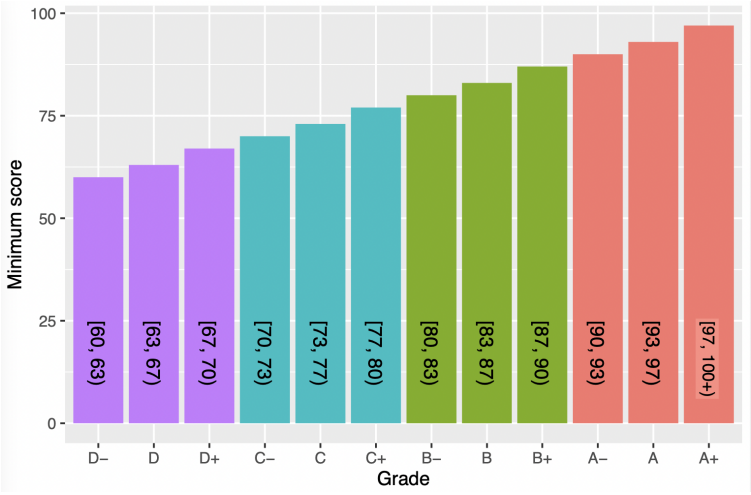
- Assigned after each Thursday lecture and due by 11:59 pm on Monday
- One homework assignment will be dropped or counted as bonus (not to exceed 100% credit). As a result, no extensions or make ups will be permitted.
- Students are encouraged to collaborate on homework problems, but what you submit should reflect your own effort.

Exams:
- Given in class only in ECSS 2.410. No exceptions.
- Scantron required (Red Form F-1712-PAR-L)
- The required calculator (or similar) is permitted. No devices with wifi.
- Closed book, closed notes.
- Come to the reviews for practice and earn bonus points.
- Begin to study at least one week prior to each exam.
- Exam 2 is non-cumulative.
- Missing an exam results in a grade of zero.
- It is the responsibility of each student to consult with the university calendar before scheduling travel plans. Under no circumstances will an exam be rescheduled for any student who fails to plan accordingly.
- If you miss an exam due to illness or other emergency, you must provide appropriate documentation as evidence in support of your request.

Course Schedule (Tentative)

Week	Date	Topic	Chapter	Due
1	Jan 17	Course overview + probability basics	1-2	
1	Jan 19	Probability of Unions and Intersections	2	
2	Jan 24	Conditional Probability and Independence	2	HW1
2	Jan 26	Law of Total Probability and Bayes Rule	2	
3	Jan 31	Discrete Random Variables (R.V.)	3	HW2
3	Feb 2	Bernoulli & Binomial R.V.	3	
4	Feb 7	Geometric & Negative Binomial R.V.	3	HW3
4	Feb 9	Poisson R.V. + Ch 4 Intro	3/4	
5	Feb 14	Continuous R.V. & Uniform R.V.	4	HW4
5	Feb 16	Exponential and Gamma R.V.	4	
6	Feb 21	Normal R.V.	4	HW5
6	Feb 23	Normal R.V. & Central Limit Theorem	4	
7	Feb 28	Stochastic Processes	6-7	HW6
7	Mar 2	Stochastic Processes	6-7	
8	Mar 7	Review for Exam #1	-	HW7
8	Mar 9	**Exam #1**	-	
9	Mar 14	*Spring Break - no classes*	-	
9	Mar 16	*Spring Break - no classes*	-	
10	Mar 21	Intro to Statistics	8	
10	Mar 23	Intro to Statistics	8	
11	Mar 28	Point Estimation	9	HW8
11	Mar 30	Point Estimation	9	
12	Apr 4	Confidence Intervals for Proportions	9	HW9
12	Apr 6	Confidence Intervals for Means & t-distribution	9	
13	Apr 11	Intro to Hypothesis Testing	9	HW10
13	Apr 13	Significance Tests: Means	9	
14	Apr 18	Significance Tests: Proportions	9	HW11
14	Apr 20	Significance Tests: Categorical Data	10	
15	Apr 25	Linear Regression: Correlation, Least Squares	11	HW12
15	Apr 27	Linear Regression: Inference, Multiple Regression	11	
16	May 2	Review for Exam #2	-	HW13
16	May 4	**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:	Limit the use of all devices during class.
Make-up exams:	Please consult the university calendar before making travel plans. No student will be permitted to reschedule an exam because they did not plan accordingly. Friday, May 12, 2023 is the official last day of the spring semester.
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.