UTD	**Course**	Probability and Statistics for Data Science and Bioinformatics
	Class number	Stat 5353.001
	Professor	Sy Han (Steven) Chiou
	Term	Spring 2019
	Schedule	Tuesday, Thursday, 10:00 am-11:15 am, CB 1.204

Professor's Contact Information

Office Phone	972.883.6362
Office Location	FO 2.410A
Email address	schiou@utdallas.edu
Course website	`http://elearning.utdallas.edu/` All course related materials, including lecture notes, will be posted here.
Office Hours	Tuesday, Thursday, 12:30 pm - 1:30 pm or by appointment.

General Course Information

Prerequisite	Calculus through multivariate calculus and department consent required.
Course Coverage	Probability; Kolmogorov's axioms; independence; random variables; discrete and continuous distributions; expected values; joint, marginal and conditional distributions; Monte Carlo simulation; sampling distributions; law of large numbers; central limit theorem; maximum likelihood estimation; confidence intervals and hypothesis testing involving one- and two-sample problems; linear regression; proofs of key results; practical examples illustrating the theory; and introduction to a statistical software.
Learning outcomes	1. A working understanding of basic probability theory. 2. Understand basic principles of statistical inference. 3. Use software and simulation to do statistics (`R` will be used in class).
Required Text	*John E. Freund's Mathematical Statistics with Applications*, eighth edition by Irwin Miller and Marylees Miller. ISBN-13: 978-0-321-80709-0.

Course Policies

Grading criteria	**Homework (25%)**: There will be 11 homework assignments throughout the semester, the lowest homework grade will be dropped. The assignments should be turned in in person, either in class or during my office hours. The first homework is due on Tuesday, January 23. **Exam 1 (25%)** **Exam 2 (25%)** **Final exam (25%)** These exams will contain a take-home portion that requires `R` and in-class a portion that are closed-book and closed-notes. No make-up exams are allowed unless a special arrangement made **in advance**. Missed exam due to oversleeping, car troubles, forgetfulness, etc., are not excused. The final exam date and time will be announced when it is available.
Policy on the use of electronic devices	For many students, using laptops or other personal computing devices in lecture is an efficient way to read lecture slides and take notes. However, using these in ways that are not related to course work can be distracting to other nearby students. Please limit the use of personal computing devices in lecture to activities directly related to the lecture.
Student conduct and discipline	The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of university business. See the UTD publication, A to Z Guide, issued to each registered student.
Academic integrity	The faculty expects from students a high level of responsibility and academic honesty. Scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, and falsifying of records. Violators face disciplinary proceedings.
Withdrawal	Deadlines for withdrawal from courses are published in each semester's course catalog. A faculty member cannot drop or withdraw a student. It is the student's responsibility to handle withdrawal procedures from any class to avoid receiving a grade of "F".

Tentative Course Schedule

	Textbook coverage	R coverage
Week 1 (1/15)	Chapter 1: Introduction	`R` editor, coding style, getting help, vector, sequences.
Week 2 (1/22)	Chapter 2: Probability	Statements, counting, sampling.
Week 3 (1/29)	Chapter 3: Probability distributions & probability densities (hw 1 due)	Random numbers generation, `R` functions, vector computation.
Week 4 (2/5)	Chapter 4: Mathematical expectation (hw 2 due)	Integration and approximation.
Week 5 (2/12)	**Exam week.** (hw 3 due)	
Week 6 (2/19)	Chapter 5: Special probability distributions	Distribution functions, quantile function.
Week 7 (2/26)	Chapter 6: Special probability densities (hw 4 due)	Distribution functions, quantile function.
Week 8 (3/5)	Chapter 7: Functions of random variables (hw 5 due)	More on random numbers.
Week 9 (3/12)	Chapter 8: Sampling distribution (hw 6 due)	Monte Carlo simulation.
	Spring break	
Week 10 (3/26)	**Exam week** (hw 7 due)	
Week 11 (4/2)	Chapter 10: Point estimation	Optimization, equation solvers.
Week 12 (4/9)	Chapter 11: Interval estimation (hw 8 due)	Confidence interval.
Week 13 (4/16)	Chapter 12: Hypothesis testing (hw 9 due)	Hypothesis tests.
Week 14 (4/23)	Chapter 13: Tests of hypothesis involving means, and proportions (hw 10 due)	More on hypothesis tests.
Week 15 (4/30)	Chapter 14: Regression and correlation (hw 11 due)	Linear regression.

More Policies

Incomplete grades	As per university policy, incomplete grades are granted only in the case of work unavoidably missed (and excused) and not already covered by the professor's policy on missed work or activities, and only if at least 70% of the course work has been completed. An incomplete grade must be resolved within eight weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade becomes changed automatically to F.
Disability services	Disability Services seeks to provide students with disabilities educational opportunities equivalent to those of their non-disabled peers. The Office of Disability Services is located in room 1.610 in the Student Union, and its hours are Monday-Thursday 8:30 a.m. to 6:30 p.m. and Friday 8:30 a.m. to 5:00 p.m. Essentially, the law requires colleges and universities to make reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally, an assignment requirement may be modified (for example, a research paper versus an oral presentation for a student who is hearing impaired).Classes including students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, notetaking, or mobility assistance. The student should notify the professor of the need for such accommodations. Disability Services provides students with letters to present to faculty members.
Syllabus policies	he 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 these policies.