



Course	Numerical and statistical computing
Class number	Stat 4354.001
Professor	Sy Han (Steven) Chiou
Term	Spring 2020
Schedule	Monday, Wednesday, 10:00 am-11:15 am, CB3 1.314

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/
Office Hours	Monday, Wednesday, 12:30 pm - 1:30 pm or by appointment.

General Course Information

Prerequisite	Math 2451 (Multivariate calculus with applications) and Stat 4351 (Probability), or instructor consent required.
Course Coverage	Solving linear and nonlinear equations; numerical differentiation and integration; optimization; Newton-Raphson and EM algorithms; QR, Cholesky, eigenvalue, and singular value decompositions; random number generation; Monte Carlo methods; Markov chain Monte Carlo methods; bootstrap and jackknife; power analysis and sample size determination; and use of a statistical software package such as R.
Learning outcomes	<ol style="list-style-type: none">1. Use software and simulation to do statistics .2. Understand basic principles of statistical inference.3. Understand how to express basic mathematical and statistical problems in R.
Required Text	<i>Statistical computing with R</i> , second edition by Maria L. Rizzo. ISBN-13: 978-1466553323.

Course Policies

Grading criteria	Homework (30%): There will be 6 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 Wednesday, January 29. Exam 1 (35%), Exam 2 (35%): 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.
Letter grade	The letter grade will be assigned based on the overall course score with the cutoffs: A⁺ : [97, 100]; A : [93, 97]; A⁻ : [90, 93]; B⁺ : [87, 90]; B : [83, 87]; B⁻ : [80, 83]; C⁺ : [77, 80]; C : [73, 77]; C⁻ : [70, 73]; D⁺ : [67, 70]; D : [63, 67]; D⁻ : [60, 63]; F : [0, 60].
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

Week 1 (1/13)	Chapter 1: Introduction
Week 2 (1/20)	Chapter 1: Introduction
Week 3 (1/27)	Chapter 1: Introduction
Week 4 (2/3)	Chapter 2: Probability and statistics review
Week 5 (2/10)	Chapter 3: Methods for generating random variables
Week 7 (2/17)	Chapter 4: Generating random processes
Exam week.	
Week 8 (3/2)	Chapter 13: Introduction to numerical methods in R
Week 9 (3/9)	Chapter 13: Introduction to numerical methods in R
Spring break	
Week 10 (3/23)	Chapter 14: Optimization
Week 11 (3/30)	Chapter 14: Optimization
Week 12 (4/6)	Chapter 8: Bootstrap and Jackknife
Week 13 (4/13)	Chapter 8: Bootstrap and Jackknife
Week 14 (4/20)	Chapter 9: Resampling applications

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, note-taking, 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	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 these policies.