UTD	**Course** Numerical and statistical computing **Class number** Stat 4354.001 **Professor** Sy Han (Steven) Chiou **Term** Spring 2022 **Schedule** Monday, Wednesday, 10:00 am-11:15 am

Professor's Contact Information

Office Phone	972.883.6362
Office Location	FO 2.610D
Email address	schiou@utdallas.edu
Office Hours	Monday, Wednesday, 1:00 pm - 2:00 pm or by appointment. Virtual office hours will be held using Microsoft Teams.
Teaching Assistant	Mr. Bhanu Garg; bhanu.garg@utdallas.edu

Course Modality and Expectations

Instructional mode	Remote/virtual through Friday, Feb. 4, in-person instruction afterward.
Course website	All course related materials, including lecture notes, will be posted on eLearning.
Prerequisite	Math 2451 (Multivariate calculus with applications) and Stat 4351 (Probability).
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 the statistical software R.
Learning outcomes	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	*Statistical Computing with R*, second edition by Maria L. Rizzo. ISBN-13: 978-1466553323.

Course Policies

Grading criteria	**Homework (60%)**: • There will be 11 homework assignments throughout the semester. • The lowest homework grade will be dropped. • Assignments should be completed in R Markdown. • Late assignments will not be graded and will be counted as 0. • The first homework is due on Monday, January 31. **Exams (20% + 20%)**: • There will two exams. • Exam 1 will be in a multiple choice format and is in-class. • Exam 2 will consist of both an in-class portion and a take-home portion. • Late submission will not be accepted unless a special arrangement is made **in advance**. • Missed due date due to oversleeping, car troubles, forgetfulness, etc., are not excused.
Letter grade	The letter grade will be assigned based on the overall course score with the cutoffs: $\mathbf{A^+}$: [97, 100]; $\mathbf{A}$: [93, 97]; $\mathbf{A^-}$ [90, 93); $\mathbf{B^+}$ [87, 90); $\mathbf{B}$ [83, 87); $\mathbf{B^-}$ [80, 83); $\mathbf{C^+}$ [77, 80); $\mathbf{C}$ [73, 77); $\mathbf{C^-}$ [70, 73); $\mathbf{D^+}$ [67, 70); $\mathbf{D}$ [63, 67); $\mathbf{D^-}$ [60, 63); $\mathbf{F}$ [0, 60).
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 (1/17)	Chapter 1: Introduction to R, R Studio and R markdown
Week 2 (1/24)	Chapter 1: Introduction to R, R Studio and R markdown
Week 3 (1/31)	Chapter 1: Introduction to R, R Studio and R markdown
Week 4 (2/7)	Chapter 2: Probability and statistics review
Week 5 (2/14)	Chapter 2: Probability and statistics review
Week 6 (2/21)	Chapter 3: Methods for generating random variables
Week 7 (2/28)	Chapter 3: Methods for generating random variables
Week 8 (3/7)	Chapter 3: Methods for generating random variables
	Spring break
Week 9 (3/21)	Chapter 4: Generating random processes (Poisson process)
Week 10 (3/28)	Chapter 4: Generating random processes (Poisson process)
Week 11 (4/4)	Chapter 4: Generating random processes (Poisson process)
Week 12 (4/11)	Chapter 7 & 8: Monte Carlo Methods in Inference, Bootstrap and Jackknife (Selected topics)
Week 13 (4/18)	Chapter 13 & 14 Numerical methods and Optimization (Selected topics)
Week 14 (4/25)	Chapter 13 & 14 Numerical methods and Optimization (Selected topics)
Week 15 (5/2)	Chapter 13 & 14 Numerical methods and Optimization (Selected topics)

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.
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".
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	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.