



Course	Probability and Statistics for Data Science and Bioinformatics
Class number	Stat 6390.001
Professor	Sy Han (Steven) Chiou
Term	Fall 2018
Schedule	Tuesday, Thursday, 10:00 am-11:15 am, CB 1.214

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 basic knowledge of regression methods, statistical methods for estimation and inferences.
Course Coverage	The course will cover the basic concepts and methods for analyzing survival time data. Some of the key topics to be covered are: characteristics of survival data, Nelson-Aalen estimator, Kaplan-Meier estimator, log-rank tests, counting processes and martingales, estimation and inference methods for parametric survival models, proportional hazard models, accelerated failure time models. Statistical software, R, will be introduced in the lectures and used for homework assignments and projects.
Learning outcomes	As a result of completing this course, students should be able to identify survival data and apply appropriate methods in practical settings. For students who are looking for a research topic in survival analysis, a thorough understanding of the presented theories and additional readings will be beneficial.
Required Text	<i>Applied survival analysis: Regression modeling of time-to-event data</i> , second edition by David W. Hosmer, Stanley Lemeshow, and Susanne May. ISBN: 978-0-471-75499-2

Course Policies

Course grade	Homework: 50%: Homework will be assigned on a roughly biweekly basis. The assignments should be turned in <i>in person</i> and be prepared using either <i>R markdown</i> or <i>knitr</i> . Exams (1 midterm & 1 Final): 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 <i>in advance</i> . 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 grades	A+: 96 - 100 A: 93 – 95.99 A-: 90 – 92.99 B+: 86 - 90 B: 83 – 85.99 B-: 80 – 82.99 C+: 76 - 80 C: 73 – 75.99 C-: 60 – 72.99 F: 0 – 59.99.
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.
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 (subject to change)

	Coverage	Topics
Week 1 (8/21)	Chapter 1	Typical censoring and truncation mechanisms
Week 2 (8/28)	Chapter 2	Estimating the survival function (Kaplan-Meier estimator)
Week 3 (9/4)	Chapter 2	Comparison of survival functions (log-rank test)
Week 4 (9/11)	Chapter 2	Other functions of survival time and their estimators (Nelson-Aalen estimator)
Week 5 (9/18)	Chapter 2	Other functions of survival time and their estimators (Nelson-Aalen estimator)
Week 6 (9/25)	Chapter 8	Parametric regression models
Week 7 (10/2)	Chapter 8	Parametric regression models
Week 8 (10/9)	Exam	
Week 9 (10/16)	Chapter 3	Proportional hazards regression model
Week 10 (10/23)	Chapter 3	Proportional hazards regression model
Week 11 (10/30)	Chapter 4	Interpretation of a fitted proportional hazards regression model
Week 12 (11/6)	Chapter 4	Interpretation of a fitted proportional hazards regression model
Week 13 (11/13)	Chapter 5	Model development
Week 14 (11/27)	Chapter 5	Model development
Week 15 (11/4)	Chapter 9	Other models (accelerated failure time model and others)

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.
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.
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.