



**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

Syllabus updated on 08/12/2018.

### 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** *Applied survival analysis: Regression modeling of time-to-event data*, second edition by David W. Hosmer, Stanley Lemeshow, and Susanne May. ISBN: 978-0-471-75499-2

### Course Policies

**Course grade**

**Traditional option:**  
**Homework 50%** Homework will be assigned on a roughly biweekly basis to be turned in *in person* and be prepared using either *R markdown* or *knitr*.  
**Exams (1 midterm & 1 Final) 50%** Take-home exams will be given a week before due dates. Must be prepared using either *R markdown* or *knitr*.

**Project option:**  
Must inform me of your project topic by **11/1**. Up to 2 students can work on a topic.  
**Project presentation 50%** A 30 minutes presentation to be scheduled during the last week of the class.  
**Report 50%** An initial draft is due the week before presentation, and the final report is due on the final exam date.

**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.

## Tentative Course Schedule (subject to change)

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

## More Policies

<b>Incomplete grades</b>	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.
<b>Academic integrity</b>	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.
<b>Withdrawal</b>	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".
<b>Student conduct and discipline</b>	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.
<b>Disability services</b>	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.
<b>Syllabus policies</b>	The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to <a href="http://go.utdallas.edu/syllabus-policies">http://go.utdallas.edu/syllabus-policies</a> for these policies.