Fall 2013  
Statistics 678: Survival Analysis

I. General Information

Lecture:  
MW 2:00-3:15 pm, SSW 2649  
Course web pages: rohan.sdsu.edu/~jjfan/sta678  
and http://blackboard.sdsu.edu

Instructor:  
Juanjuan Fan  
Office: GMCS 519  
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Office Hours: MW 10:00-10:50 am, GMCS 519

Textbook:  
Survival Analysis: Techniques for Censored and Truncated Data, 2nd Ed.  
by JP Klein and ML Moeschberger (2003), Springer

References:  
by DG Kleinbaum and M Klein (2012), Springer  
2. Proportional Hazards Regression  
by J O’Quigley (2008), Springer  
3. Actuarial Mathematics for Life Contingent Risks, 2nd Ed.  
by D CM Dickson, MR Hardy, and HR Waters (2009), Institute and Faculty of Actuaries

Prerequisites:  
Stat 551B or 670B

Grading:  
Two midterms: 40% (20% each)  
Class presentation or written report: 15%  
Final: 45%

Exams and report:  
Late assignments will not be accepted.  
NO early or makeup exams are given - no exceptions.

II. Other Information

1. Homework assignments and solutions will be posted on blackboard. The homeworks are not collected.
2. There will be two in-class midterms on Wednesdays, October 2 and November 6.

3. There will be a final exam on Monday, December 16, 1-3 pm.

4. You will be asked to do a class presentation towards the end of the semester. If you are a distance learner, you can choose to write a written report instead of giving a class presentation.

5. You can choose to use any statistical package available for analyzing censored survival data. However, help will be available only if you use R. A R introductory session will be given and relevant R commands will be taught in class.

IV. Tentative Course Content

1. Introduction: overview, survival data, functions in survival analysis, censoring mechanisms Chapters 1-2

2. Nonparametric estimates and inferences: Kaplan-Meier estimator, Nelson-Aalen estimator, logrank, stratified logrank and trend tests Chapters 4 & 7

3. The Cox proportional hazards model: partial likelihood, Wald, score and likelihood ratio tests, Breslow estimator, stratification Chapters 8-9

4. Cox regression model diagnostics: residuals, functional forms, outlying and influential cases, checking the PH assumption, model validation Chapter 11

5. Parametric regression models Chapter 12

6. Multivariate survival analysis: marginal approach, frailty models, counting process formulation, time-dependent covariates Chapter 13