BST/STA 222
Fall 2023

Survival Analysis

David M. Rocke
September 28, 2023

Course Information

Class Meetings:	Tuesday and Thursday 2:10pm–3:30pm 107 Cruess Hall
Lab:	Tuesday and Thursday 3:40pm–4:00pm 107 Cruess Hall
Office Hours:	Tuesdays 10:30am–11:30am in person at my office. Or by appointment, in person or Zoom.
Office:	140B Med Sci 1C, (530) 752-6999 Cell: 530-304-1019 e-mail: dmrocke@ucdavis.edu web site: http://dmrocke.ucdavis.edu/ Email list: bst-sta222-f23@ucdavis.edu Canvas site for both courses is BST 222
Required Text:	**Survival Analysis : Techniques for Censored and Truncated Data.** Klein, John P. and Moeschberger, Melvin L., Springer, 2005.
Optional Texts:	**Statistical Analysis of Failure Time Data, Second Edition.** John Kalbfleisch and Ross Prentice, Wiley, 2002. *Mostly useful for parametric survival analysis.* **Applied Survival Analysis Using R.** Dirk Moore, Springer, 2016.
Software:	Example analyses will be in R and sometimes SAS. For homework, R is suggested.
TA:	Brittany Lemmon (blemmon@ucdavis.edu).
Course Grading:	Letter Grades based on – Homework – Exams – Possible Projects
Prerequisites	Statistical theory courses such as STA 231AB, STA 200ABC, or STA 131ABC.

This course is an introduction to methods for the analysis of time-to-event data such as occur in medical and epidemiological research, engineering reliability studies, and actuarial calculations, with the main emphasis on the first of these three fields of application. Topics include censoring and truncation of data, life tables, nonparametric methods, parametric methods, accelerated failure time models, proportional hazards models, and likelihood and partial likelihood. We will look at the theoretical underpinnings of the models, but the main emphasis will be on model formulation, computation, and interpretation of results.

Topical Outline (Subject to Change)

- Introduction to Survival Analysis
- Basic Quantities and Models in Survival Analysis
- Survival Data and Methods
- Nonparametric Survival Analysis
- Survival Regression
- Hypothesis Tests in Survival Analysis
- Model Building and Checking in Survival Analysis
- Extensions to the Cox Model: Stratification
- Extensions to the Cox Model: Time Dependent Covariates and Multiple Events
- Extensions to the Cox Model: Time Dependent Covariates and Multiple Events
- Multiple Testing and Comparisons in Survival Analysis
- Interval and Double Censoring
- Parametric Survival Models
- Parametric Survival Regression