



*Students requiring accommodations as a result of disability must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca*

**Instructor:** [Dr. Joan Hu](#)

**Prerequisite:**

STAT 450. Students with credit for STAT 806 may not repeat this course for further credit.

**Textbook:**

Recommended:

*Survival Analysis: Techniques for Censored and Truncated Data, 2<sup>nd</sup> ed.*, by John Klein and Melvin Moeschberger. Publisher: Springer

**Reference:**

1. *Analysis of Survival Data*, by Cox and Oakes
2. *Counting Processes and Survival Analysis*, by Fleming and Harrington
3. *The Statistical Analysis of Failure Time Data*, by Kalbfleisch and Prentice
4. *The Statistical Analysis of Recurrent Events*, by Cook and Lawless
5. *Statistical Models and Methods for Lifetime Data*, by Lawless
6. *Statistical Models Based on Counting Processes*, by Andersen, Borgan, Gill and Keiding
7. *Survival Analysis Using SAS: A Practical Guide*, Author: Paul Allison, Publisher: SAS Publishing

**Calendar Description:**

Statistical methodology used in analysing failure time data. Likelihoods under various censoring patterns. Inference using parametric regression models including the exponential, Weibull, lognormal, generalized gamma distributions. Goodness-of-fit tests. The proportional hazards family, and inference under the proportional hazards model. Stratification and blocking in proportional hazards model. Time dependent covariates. Regression methods for grouped data.

**Outline:**

This course introduces to students the most important statistical approaches in analyzing event history data. It includes parametric inferences with likelihood functions under various censoring patterns, and non/semiparametric inferences such as Kaplan-Meier estimator, logrank test, and the Cox proportional hazards model. Some advanced topics will be covered, including counting process framework, various forms of incomplete lifetime data (e.g., competing risks, interval censoring, and truncation), recurrent events and multi-state process, and alternative regression models to the Cox proportional hazards model.

1. Introduction
2. Likelihood-Based Parametric Inferences
3. Kaplan-Meier Estimator, Logrank Test, Cox Proportional Hazards Model
4. Counting Process Framework
5. Competing Risks, Interval Censoring and Truncation
6. Recurrent Events and Multi-State Process
7. Alternative Regression Models

**Grading Scheme:**

Assignments 60%  
Projects 40%

***Grading is subject to change.***

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*Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Students are encouraged to review policies pertaining to academic integrity available on Student Services webpage at <http://students.sfu.ca/academicintegrity.html>*

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