

AS4823A/AS9004A Course Outline

1. Course Information

Course Information

Course Number: AS4823A/AS9004A

Course Name: Survival Analysis

Academic Term: Fall, 2023

Lectures: M: 2:30-4:30pm, W:3:30-4:30pm

Class Room : WSC 240

List of Prerequisites

A minimum mark of 60% in Statistical Sciences 3858B

Unless you have either the requisites for this course or written special permission from your Dean's Designate (Department/Program Counsellors and Science Academic Counselling) to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors

3. Course Syllabus, Schedule, Delivery Mode

Survival models, nonparametric estimation of the survival functions, one and two or more sample hypothesis tests, inference for semiparametric regression models, inference for parametric regression models.

Learning Outcomes

This course is intended to provide students with an understanding of the theory and applications of survival analysis. By the end of the course, students are expected to be able to perform statistical inference for various types of survival data by using parametric, semi-parametric or nonparametric survival models.

Table of Contents and Schedule

1. Introduction to survival analysis.
2. Essential preliminaries: survivor function, hazard function, cumulative hazard function, density function and their relationships for both continuous and discrete survival times. Censoring and truncation.
3. Basic properties of lifetime distributions: the common lifetime distributions, how the distributions are derived in survival analysis, and their properties that are essential in choosing distributions in practice.
4. Non-parametric estimation and graphical methods: Kaplan-Meier estimator, Nelson-Aalen estimator, and their variance estimators; Log-rank test for distribution difference; Graphical methods that combining nonparametric estimation and choices of parametric models in practice.
5. Parametric survival models: statistical inference for parametric model settings.
6. Regression analysis for parametric models: goodness of fit and model selection for regression models under parametric settings.
7. Regression analysis for semi-parametric models: goodness of fit and model selection for regression models under semi-

4. Course Materials

Main Reference Books:

1. Statistical Models and Methods for Lifetime Data, 2nd Edition, by Jerald F. Lawless, John Wiley & Sons, 2003.
2. The Statistical Analysis of Failure Time Data, 2nd Edition, by John D. Kalbfleisch and Ross L. Prentice. John Wiley & Sons, 2002.

Students are responsible for checking the course OWL site (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Assignments (3)	_20_ %
Test #1	_20_ %
Test #2	_25_ %
Final group project	_25_ %
Presentation	_10_ %

Three assignments due in class on

Oct. 4
Nov. 8
Nov. 29

Two tests in class (closed book)

Test #1: Oct. 18 (W: 3:30-4:20pm)
Test #2: Nov. 29 (W: 3:30-4:20pm)

Group project presentations:

Dec. 4,6

Final group project due

Dec. 11, 11:59pm (Canadian Eastern Time)
Group membership will be randomly assigned.

Course-specific conditions that are required to pass the course:

- There will be no final grade if both tests are missed. If there are logistical reasons to miss both tests, the student will receive a grade of Incomplete (INC) and will get assessment with the next offering of the course.

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8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>.

Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.