

AS4823A/AS9004A Course Outline

1. Course Information

Course Information

Course Number: AS4823A/AS9004A

Course Name: Survival Analysis

Academic Term: Fall, 2024

Lectures: MWF: 3:30-4:30pm

Class Room : MC-17

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	Email	Office	Phone	Office Hours
Dr. Wenqing He	whe@stats.uwo.ca whe23@uwo.ca	WSC213	519-6612111 ext. 86982	Mon. 12:30pm- 1:30pm (In person)
TA: Yijia Weng	yweng54@uwo.ca			

Students must use their Western (@uwo.ca) email addresses when contacting their 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-parametric settings where part of the models is left unspecified.

Key Sessional Dates

Classes begin: September 5, 2024

Canada Life Day: September 13. No class

Fall Reading Week: October 12 – 20, (including Thanksgiving, Oct. 14)

National Day for Truth and Reconciliation: September 30, 2024, no class

Classes end: December 6, 2024

Exam period: December 9 – 22, 2024

Contingency plan

Although the intent is for this course to be delivered in person, should any university-declared emergency require some or all of the course to be delivered online, either synchronously or asynchronously, the course will adapt accordingly. The grading scheme will **not** change. Any assessments affected will be conducted online as determined by the course instructor.

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)	_15_%
Tests (3)	_50_% (Better two get 20% each, the other gets 10%)
Final group project	_25_%
Presentation	_10_%

Three assignments due in class on

Oct. 2
Nov. 1
Nov. 27

Three tests in class (closed book, one double-sided letter-size formula sheet is allowed)

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

Group project presentations:

Dec. 2, 4, 6

Final group project due

Dec. 8, 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 all three tests are missed. If there are logistical reasons to miss all three tests, the student will receive a grade of Incomplete (INC) and will get assessment with the next offering of the course.

General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs* posted on the Academic Calendar:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. Since flexibility is incorporated into the weighting of grades for the term tests assessment component, those tests are excluded from this and therefore always require formal supporting documentation.

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the tests, the request cannot be recalled and reapplied. This privilege is forfeited.

Accommodated Evaluations

- Late assessments without valid medical or supporting documentation will be counted 0.
- Late assessments with valid medical or supporting documentation should be submitted within 24 hours.
- No make-up tests. If valid documents are provided, the weight of one test will be redistributed to either the other tests or the final project, determined by the instructor.
- If all three tests are missed with whatever reasons, the student will receive an incomplete (INC) in the course grade. The student will get assessment from the next time the course is offered.

Rounding of Marks Statement

Across the Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g.,

74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

6. Additional Statements

Religious Accommodation

When conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible but not later than two weeks prior to the writing or the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university’s EDID website for the recognized religious holidays:

<https://www.edi.uwo.ca>.

Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual’s official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Non-programable calculators are allowed in the tests. Any other electronic devices cannot be used as calculators in the tests.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Support Services

Please visit the Science & Basic Medical Sciences Academic Advising 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.