University of Guelph
Department of Mathematics and Statistics
College of Engineering and Physical Sciences
STAT*6761: Survival Analysis (0.5 credit)

Winter 2023 Course Outline

Instructor: Gerarda Darlington
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Office hours: TBA

Lectures: Tuesday, Thursday 8:30am to 9:50am in MCKN, Room 261

Course description: Kaplan-Meier estimation, life-table methods, the analysis of censored data, survival and hazard functions, a comparison of parametric and semi-parametric methods, longitudinal data analysis.

Course materials:
Textbook available online via lib.uoguelph.ca:
Survival Analysis: A Self-Learning Text, 3rd Edition by D.G. Kleinbaum and M. Klein

Course Objectives:
By the end of the course you should be able to:

- Identify scenarios requiring survival analysis techniques
- Understand and address censoring
- Have facility with software for analyzing survival analysis data
- Interpret the results of survival analyses
- Prepare and deliver scientific seminars
- Write scientific papers

Marking Scheme and Due Dates:

In-Class Discussions	20%	
Assignments	20%	2 assignments (10% each) Due dates are: February 16 before 5:00pm; March 23 before 5:00pm
Article Summaries	20%	4 article summaries (5% each) Due dates for summaries are: January 26 before 5:00pm; February 9 before 5:00pm; March 9 before 5:00pm; March 30 before 5:00pm.
Project Seminar	15%	Held in the final week of classes
Written Project	25%	Due Tuesday April 18 before 5:00pm **Project topic must be selected by March 16**

NO LATE WORK WILL BE ACCEPTED.

NOTE: You should have **NO** conflicts concerning these dates and times. If you do it is your responsibility to resolve them as soon as possible.

Submission and preparation details

Assignments:
Assignments will involve methods questions, data analyses, and results interpretations and the work that you submit must be your own work. Your submissions must be handed in by the indicated deadlines using the Dropbox option on the STAT*6761 Courselink site. *Turnitin* and Google will be used to check for potential plagiarism/copying. **Late submissions will not be accepted.**

Article Summaries:
Possible journal articles for article summaries will be posted on Courselink one week in advance of deadlines and you must select one of the possible articles for each topic. By the deadlines, you must write summaries of these applications papers **in your own words** with a length of no more than two double-spaced pages in 12 point font with one inch margins. Your submissions must be handed in by the indicated deadlines using the Dropbox option on the STAT*6761 Courselink site. *Turnitin* and Google will be used to check for potential plagiarism/copying. **Late submissions will not be accepted.**

Project Seminar and Final Written Project:
The seminar/final project will be on a topic of your choice that is relevant to course topics. A list of possible topics will be provided and a **project topic must be selected by March 16**. The goal of the project is to present details on a specific method not covered as part of the course material.

Seminars will be held during the final week of the course. Each seminar must be no more than 20 minutes in length. You are expected to attend and provide feedback on all student seminars.

The final written project must be submitted using the Dropbox option on the STAT*6761 Courselink site by the indicated deadline. **Late submissions will not be accepted.** The final project, including tables, figures, and references, must be no more than 12 pages with text that is double-spaced and in 12 point font with one inch margins. Tables and/or figures must be clearly labelled and clearly referred to in the text. Attaching computer output is not acceptable. Any computer code used must be commented and included with your project as an appendix. This appendix is not included in the page limit. References to all sources of information must be made throughout the text in the style used in the journal *Biometrics* or using the *apa* bibTEX style and a list of correct references must be included. Your project outline and final project **must be in your own words**. *Turnitin* and Google will be used to check for potential plagiarism/copying.

Seminars and final projects will be graded based on content, writing, difficulty/originality, and overall presentation.

Recording of Materials: Presentations that are made in relation to course work – including lectures – cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

E-mail Communication: As per university regulations, all students are required to check their University of Guelph GryphMail account <uoguelph.ca> regularly: e-mail is the official route of communication between the University and its students.

When You Cannot Meet a Course Requirement: When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The regulations and procedures for Academic Consideration are detailed in the Graduate Calendar.

Drop Date: Students will have until the last day of classes to drop courses without academic penalty. The regulations and procedures for course registration and dropping courses are available in the graduate calendar: General Regulations

Copies of Assignments: Keep paper and/or other reliable back-up copies of all assignments: you may be asked to resubmit work at any time.

Accessibility: The University of Guelph committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact Accessibility Services at 519-824-4120 ext. 56208 or email accessibility@uoguelph.ca

Academic Misconduct: The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy is detailed in the Graduate Calendar.

Resources: The Academic Calendars are the sources of information about the University of Guelph's procedures, policies and regulations that apply to undergraduate, graduate and diploma programs.

Disclaimer: Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via Courselink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (https://news.uoguelph.ca/2019-novel-coronavirus-information/) and circulated by email.

Illness: Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for

multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment).

COVID-19 Safety Protocols: For information on current safety protocols, follow these links:

- https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Please note, that these guidelines may be updated as required in response to evolving University, Public Health or government directives.

Tentative Lecture Schedule:

Week	Topics
Jan 9 – 13	Survival time data; Logistic regression
Jan 16 – 20	Poisson regression; Kaplan-Meier curves; Log rank test
Jan 23 – 27	Exponential distribution; Parameter estimation from software
Jan 30 – Feb 3	Cox proportional hazards (CPH) model; Handling ties; Plots from CPH model results
Feb 6 – 10	Checking CPH assumptions; Stratified Cox model
Feb 13 – 17	Time-dependent variables: Extended Cox model
Feb 20 – 24	Winter Break – no lectures/office hours
Feb 27 – Mar 3	Parametric survival models – Proportional hazards
Mar 6 – 10	Parametric survival models – Accelerated failure time models
Mar 13 – 17	Frailty models; Shared frailty
Mar 20 – 24	Competing risks
Mar 27 – 31	Recurrent events; Study design
Apr 3 – Apr 10	Miscellaneous final course topics; Student presentations