

# STAT 5603W: Reliability and Survival Analysis, Winter 2020

**Instructor:** Song Cai

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**Hours, Locations and Webiste:**

**Lectures:** Tue. and Thu. 8:35–9:55 at 219 Tory Building (TB)

**Office hours:** Thu. 10:30–11:30 at 5215 HP or by appointment

**Course website:** <http://people.math.carleton.ca/~scai/teaching/stat5603w-w20/>

**Important Dates:**

**Winter break (no classes):** Feb. 17–22, 2020

**Last day to withdraw from the class:** Apr. 7, 2020

**Important dates and deadlines, 2019–2020:**

<https://carleton.ca/registrar/registration/dates-and-deadlines/>

**Textbook:**

D. Collett, *Modelling Survival Data in Medical Research*, 3rd ed., CRC Press, Boca Raton, 2014

**Reference book:**

J. F. Lawless, *Statistical Models and Methods for Lifetime Data*, 2nd ed., John Wiley & Sons, Hoboken, 2003

**Prerequisites:**

Solid background in statistical inference at 4th year undergraduate Honours level. **Familiarity with R statistical software.** Familiarity with point and interval estimation, hypothesis testing, regression models, and nonparametric statistical methods.

**Assessment Rules (provisional):**

- Three or four assignments: 30%  
**Marking scheme:** 15 (perfect), 13 (good), 10 (OK), 6 (much effort needed), 3 (nonsense), 0 or 1 (you have learned nothing); no other marks
- A term project (due before Apr. 7, 2020): 35%
- A closed-book final exam: 35%

**Topics:**

1. Features of survival data; basic properties of survivor and hazard functions
2. Non-parametric procedures for analyzing survival data
3. Cox regression model: inference and model checking
4. Parametric survival models: proportional hazards model and accelerated failure time models
5. Time-dependent covariates in survival models

6. Analyzing interval-censored survival data
7. Other topics (time permits): multivariate survival models, frailty models, etc.

**Important Notes:**

- Asking content-related questions by emails is not encouraged. You should always come to my office hour for such questions to avoid unnecessary confusions.
- When asking schedule-related or clarification questions by emails, you should expect a waiting time of 24 to 48 hours for me to process.
- If you want to make an appointment other than the regular office hours, you should expect a meeting at least one week after the date you make the appointment.
- Late submissions of assignments will not be accepted and a zero mark will be given in that case unless you can provide a documented reason (e.g., medical), in which case the weight of that assignment will be shifted to the other assignments.
- If you want to see your final exam paper, you have to make an appointment within two weeks of the final exam.
- Your grade will not be changed in any case according to your special needs (such as scholarship, etc).
- Students from the University of Ottawa should gain access to cuLearn at Carleton University. To do this, follow the instruction given on <https://carleton.ca/culearnsupport/instructors/getting-started/u-of-o-students-accessing-mycarletononeculearn/>.

**Academic Integrity Policy:**

<http://carleton.ca/studentaffairs/academic-integrity/>

**Academic Accommodation:**

You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

**Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#).

**Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the [Student Guide](#).

**Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before

the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the [PMC website](#) for the deadline to request accommodations for the formally-scheduled exam (if applicable).