STAT 5503F: Linear Models, Fall 2021

Instructor: Song Cai
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Hours, Locations and Webiste:
    Lectures (online):
      Time: Tue. and Thu. 11:35–12:55
      Zoom link: https://carleton-ca.zoom.us/j/91043578065   **Passcode:** 084685
    Office hours (online):
      Time: Thu. 10:00–11:00
      Zoom link: https://carleton-ca.zoom.us/j/98736479364
    Course website:
      http://people.math.carleton.ca/~scai/teaching/stat5503f-f21/
      Brightspace (for grades only): https://brightspace.carleton.ca

Important Dates:
    First day of classes: Sep. 8, 2021
    Last day of classes: Dec. 10, 2021
    Oct. 25–29, 2021: Fall break; no classes
    Important dates and deadlines, 2021–2022:
      https://calendar.carleton.ca/academicyear/
    Dates of Religious/Spiritual Observances:
      https://carleton.ca/equity/focus/discrimination-harassment/religious-spiritual-observances/
      Note: It is your responsibility to inform me which holy days apply to you and you have to do so within the first two weeks of the class. The due dates for assignments and exams will not be changed for holy days after this two-week period.

Textbook:
    Monahan, John F., *A Primer on Linear Models*, Chapman & Hall/CRC, London 2008

Reference Books:
    Seber, George A.F. and Lee, Alan J., *Linear Regression Analysis*, 2nd ed., Wiley, Danvers 2003

    Seber, George A.F., *The Linear Model and Hypothesis: A General Unifying Theory*, Springer, New York 2015

    Christensen, Ronald, *Plane Answers to Complex Questions: The Theory of Linear Models*, 4th ed., Springer, New York 2011

    Faraway, Julian J., *Extending the Linear Model with R: Generalized Linear, Mixed Effects and Nonparametric Regression Models*, 2nd ed., Chapman & Hall/CRC, London 2016

    McCullagh, Peter and Nelder, John A., *Generalized Linear Models*, 2nd ed., Chapman & Hall/CRC, London 1989

Prerequisites:

Required: Mathematical Statistics at the level of STAT 5600.

Assessment Rules (provisional):

Please note that tests and examinations in this course will use a remote proctoring service provided by Scheduling and Examination Services. You can find more information at https://carleton.ca/ses/e-proctoring/.

- Three or four assignments: 20%
- A 80-minute in-class midterm exam (on Oct. 19): 30%
- A final exam scheduled by the University: 50%
  Note: To pass the course, one has to obtain at least 70/100 in the final exam.

Topics (provisional):

1. Introduction to linear models (Chapter 1)
2. Least squares estimator and its properties (Chapter 2 & 3)
3. More on estimation: Gauss–Markov theorem and generalized least squares (Chapter 4)
4. Hypothesis testing under linear models (Chapter 6 & 7)
5. Variance components and random-effects models (Chapter 8)
6. Introduction to generalized linear models

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 ask for the appointment.
- All due dates and deadlines are non-negotiable.
- If you miss the midterm exam you will receive a zero for that exam unless you provide me with a properly documented reason (e.g., medical), in which case the weight of that exam will be shifted to the final exam. No makeup exams will be given in normal circumstances.
- 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 those assignments will be shifted half to the midterm exam and half to the final exam.
- If you do not pass the final exam (50/100 or more for undergraduate students and 70/100 or more for graduate students), you fail regardless your term marks.
- 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 Brightspace at Carleton University. To do this, follow the instruction given at `https://gradstudents.carleton.ca/faculty-of-graduate-and-postdoctoral-affairs-access-to-brightspace/`.

Academic Integrity Policy:

https://carleton.ca/registrar/academic-integrity/
https://science.carleton.ca/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 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).