STA 2101F: Methods of Applied Statistics I
Wednesday, 10am − 1 pm Eastern   September 14 – December 7 2022
SF 3201

From the calendar:
    This course will focus on principles and methods of applied statistical science. It is designed for MSc and PhD students in Statistics, and is required for the Applied Paper of the PhD comprehensive exams. The topics covered include: planning of studies, review of linear models, analysis of random and mixed effects models, model building and model selection, theory and methods for generalized linear models, and an introduction to nonparametric regression. Additional topics will be introduced as needed in the context of case studies in data analysis.
Prerequisites: ECO374H1/ECO375H1/STA302H1 (regression); STA305H1 (design of studies)

Course Delivery:
    On September 14, the class will be delivered online at the scheduled time (Wednesday, 10am -1 pm Toronto time) over Zoom. (Join from Quercus page.) This lecture will be recorded, for viewing offline after the scheduled time.
    From September 21 we will meet in person in SF 3201. The slides for the lectures will be posted, on good weeks before the scheduled course time, and on rushed weeks just after. I am planning to record the lectures as well.
    Each week we will (try to) cover: some technical material on statistical methods, some general principles of applied statistics, and some discussion of current events.
    We will use Piazza for discussion; you will find an entry for Piazza in the course menu. If you click it, you will be asked to sign up.

Grading:
    The grade in the course will be based on weekly homework questions (60%), due the following week, and a final project (40%).
    The final project will be due on December 19, 2022. This will consist of analysis of a data set; details will be forthcoming. You will submit a report on the analysis of the data, along with reproducible R code. Pre-submissions of various pieces will be required throughout the term.

Academic Integrity:
    Discussion about your work with your classmates is encouraged, but the homework solutions you submit must be written, and coded, independently. You may use code provided by by me without attribution, but you must acknowledge code taken

from any other source using a proper bibliographic reference. To protect yourself from potential academic integrity offences, do not share your code and written submissions. The University of Toronto's Code of Behaviour on Academic Matters is available at http://academicintegrity.utoronto.ca.

Computing:

I will always refer to the `R` computing package and I highly recommend the `RStudio` environment. You will need to install both of these on your laptop. I am using Version 4.1.1 of `R`, and Version 2021.09.0+351 of `RStudio`. You can download `R` from http://cran.utstat.utoronto.ca/ and the free Desktop Version of `RStudio` from https://rstudio.com/products/rstudio/#rstudio-desktop.

I also strongly recommend using R Markdown to prepare your homework, but you can use LateX or Word if you must. For questions involving computing you will need to submit working code. This is easy in R Markdown, but R scripts will also be accepted.

There are many online resources for `R` and `Rstudio`. If you are new to `R`, you could look at Quick-R. `RStudio` has some recommendations on their education page. For more experienced users, the Cheatsheets are invaluable.

Texts:

Linear Models with `R` by J.J. Faraway (Chapman & Hall)

Extending the Linear Model with `R` by J.J. Faraway (Chapman & Hall)

Principles of Applied Statistics by D.R. Cox and C.A. Donnelly. (Cambridge University Press).

Statistical Models by A.C. Davison. (Cambridge University Press).

Course web page(s):

The course materials will be posted to the web page https://utstat.toronto.edu/reid/html/sta/sta2101f.html. The Quercus page for STA2101H will lead you to this page. I will use Quercus for discussion (via Piazza), homework reminders and grades management.

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