

STA442/2101: Methods of Applied Statistics

University of Toronto, Fall 2017

<http://www.utstat.toronto.edu/~brunner/appliedf17>

Lecture: Friday 2:10-5:00 in SS2118.

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- Office Hours: Wednesday 12:10-2:00 in UC85 and Friday 12:10-1:00 in SS2111

Note: I do not read my email every day, and the problem tends to get worse as the term progresses. It is much more efficient to talk with me before or after class, or during office hours.

Textbooks: These are available in PDF format free of charge. The texts are mostly for background reading in case you need some review, or you want to go beyond what is covered in lecture.

- [Linear models with R](#) (2009) by J. Faraway.
- [Linear models in statistics](#) (2008) by A. C. Renscher and B. G. Schaalje. A strong masters level regression text.
- [Statistical models](#) (2003) by A. C. Davison. This is the place to look if you want the real truth about almost any applied statistical topic.
- [Introduction to R](#) by Venables, Smith and others. This free 100 page document is very helpful if you plan to do serious work with R.

Topics: Applied linear regression, Random matrices and vectors, Large-sample tools, Model mis-specification, Simulation, Likelihood methods, Logistic regression and other generalized linear models, Permutation tests, Bootstrapping, Analysis of within-cases data using mixed linear and non-linear models.

Prerequisite: For STA442, the prerequisites are STA302 and CSC108 or higher. For STA2101 the prerequisite is a course in linear regression. It is assumed that graduate students also have some computing experience. *Note that students without prerequisites may be removed from the course at any time.*

Grading: There will be a quiz each week in lecture starting Friday September 15th. There will also be a comprehensive final exam. Graduate and undergraduate students will take the same quizzes and the same final exam.

- For undergraduates (STA442) the quizzes count for 60% of your mark, and the final exam counts 40%.
- For graduate students (STA2101) the quizzes count for 60% of your mark, the project counts for 10% and the final exam counts for 30%.

There will be eleven quizzes. The lowest quiz mark will be dropped. There will be an assignment for each quiz. The knowledge you need to do each quiz is a subset of the knowledge you need to do the corresponding

assignment. Some (most) of the assignments include a computer part. You will bring printouts to the quiz and answer questions based on the printouts. Possibly, one of the quiz questions will be to hand in a printout. The non-computer parts of the assignments are just to prepare you for the quizzes; they will never be handed in.

In spite of the official weighting of the final exam, a good performance on the final can save a student from failing the course. For undergraduates, suppose your average including the final exam is a failing mark (less than 50%). If your mark on the final exam is at least 70%, or your mark on the final is at the undergraduate median or above, then you get the minimum passing mark of 50%. For graduate students, suppose your average including the final exam is a failing mark (less than 70%). If your mark on the final exam is at least 80%, or your mark on the final is at the graduate student median or above, then you get the minimum passing mark of 70%.

Policy for missed work: If you miss a quiz, the mark is zero. However, your lowest quiz mark will be dropped. If you miss a quiz with a valid excuse, your mark on the final exam will be substituted for the missing quiz mark.

Academic Honesty: It is an academic offence to present someone else's work as your own, or to allow your work to be copied for this purpose. To repeat: the person who allows her/his work to be copied is equally guilty, and subject to disciplinary action by the university. This principle applies equally to graduate and undergraduate students.

Because the computer parts of the homework assignments are often handed in, this is where problems usually arise. For the computer parts of the homework and the grad student project, the main rule is **don't copy, and don't let anyone else copy from you.**

- Never look at anyone else's printouts or show anyone your printout before the quiz when they might be handed in. Above all, do not allow anyone in the class to see your R code before a computer assignment is due, and do not look at anyone else's.
- For some quizzes, you will be asked to bring your printouts to class; maybe you will hand them in, and maybe you will use them to answer some questions. Never, ever, bring a copy of somebody else's printout, or allow anyone to have a copy of yours. Your "friends" may ask you. You are expected to refuse.
- You are allowed to compare numerical answers. Suppose one person says "What did you get for `betahat4`? My answer was 37.2." Three other people say "Yeah, that's what I got," and one person groans and opens his laptop. This is all good.
- It is permitted to copy from me and the textbooks. If your computer work is very similar to what is presented in lecture, office hours or suggested readings, that is okay.
- Direct copying of computer code from the internet (other than from our class website) is prohibited. You are expected to do the work yourself. An exception is that you may download a publicly available R package that does what you need to do. That's a *package* that you install with the Package Installer, and *not* just a function posted on the Internet.
- If you allow anyone to have an *electronic* copy of your computer work, for any reason, you are not only guilty of an academic offence, you have lost your mind.
- If you receive an electronic copy of anyone's computer assignment before it is due, it will be assumed that you used it, and you are guilty of an academic offence even if the assignment you hand in looks different on the surface. If you *accidentally* receive a copy of someone else's work, forward it to Jerry immediately with an explanation.
- The grad student project will involve SAS rather than R. Because of differences in the software, there

are slightly different guidelines for the project; these will be given later, when the project is assigned. However, the same general rule applies: **Don't copy.**

- It is acceptable to get help with your computer assignments from someone outside the class, but the help must be limited to general discussion and examples that are not the same as the assignment. **As soon as you get an outside person to actually start working on one of your computer assignments, you have committed an academic offence.**

For more detail, the latest version of the student handout "How not to Plagiarize" is available at <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize> The Academic Regulations of the University are outlined in the Code of Behaviour on Academic matters, which can be found in the Arts and Science Calendar or on the web at <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>.