STA303S, Summer 2018: Methods of Data Analysis II

Instructor:

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Lectures: Mondays and Wednesdays 9:00AM - 12:00PM, HS 610

Office Hours: Mondays 12:00PM - 2:00PM, right after class

Course webpage: q.utoronto.ca

Marking Scheme:

- Assignment 1: 20%, due July 18th by 11:59PM
- Assignment 2: 20%, due August 8th by 11:59PM
- Midterm: 20%, July 25th in class from 9:30AM - 11:00AM
- Final Exam: 40%, scheduled by Faculty

Course Outline:
Analysis of variance for one-and two-way layouts, logistic regression, loglinear models, longitudinal data, introduction to time series.

Prerequisite: STA302H1

Prerequisites will be *strictly* enforced for undergraduate students. Do not approach your instructor to ask to sign a form waiving prerequisites. Undergraduate students without the appropriate prerequisites will be removed from the course.

Assignments

Assignments will be submitted by students as follows:

- Submit a .pdf to your personalized link, which you will receive by email at your U of T email address, using the Crowdmark platform. Any format other than .pdf will be rejected
- Submit a single .Rmd file that I can execute in RStudio by pressing Cmd+Shift+K. Submit this through Quercus, the course webpage. The .Rmd file must generate your .pdf file **exactly**. Assignments that cannot be reproduced by me in this way will receive a grade of zero. I cannot stress this enough.

Late assignments will be penalized by **50 percentage points per day, starting the minute after the due date**. Do **not** hand in your assignment late, just get it done on time and avoid this extremely harsh penalty.

Midterm

The midterm will be held as follows:

- Date: Wednesday, July 25th, 2018
- Time: 9:30 - 11:00 AM, during class hours
- Location: **TBA**

Please arrive at the midterm by 9:15AM, so that you may be seated by 9:30 to begin writing at this time. Bring a calculator, a pencil and your t-card. The midterm covers topics up to and including **lecture 5** on **July 18th**.

Textbook

The **required** textbook for this course is *Extending the Linear Model with R* by Julian Faraway. I will assign weekly required readings. Here is what is meant by required reading: you should

- Read the section
- Follow along with the author's analysis by typing his code into your computer and running it.
- Attempt the relevant exercises at the end of each chapter

We're using this book not necessarily because it gives the most complete description of all the methods, but rather because it is concise and contains *dozens* of relevant datasets. We will use these datasets extensively throughout the course; in lectures, on the assignments, and on the tests. If you do the textbook readings in detail, nothing on the assignments or tests will be *that* unfamiliar to you, although I reserve the right to use data and examples from other sources if I want.

I will refer to Faraway's earlier book, *Linear Models with R* a bit at the beginning of the course; this is because ANOVA is in this book. I'll provide a complete overview of ANOVA, so this book isn't required, but it's a useful reference.

Lectures

Lectures are mandatory, and are where the majority of the course material will be delivered. They will be a combination of verbal discussion, writing on the chalkboard, and analyzing data in R interactively on the screen. You have to come to every class; I will not be posting annotated slides or summaries of material covered. I will be posting the annotated code for the data analyses we do in class, and the textbook readings are below.

Here is a schedule of lecture topics and the **required** textbook readings. “LMR” refers to Faraway: Linear Models with R, and ELMR refers to Faraway: Extending the Linear model with R, the required text for the course.

Lecture #	Date	Topic	Textbook Reading/Notes
1	July 4th	Review	Review. Required reading: ELMR Chapter 1
2	July 9th	ANOVA I	One-way anova, F-tests, sums of squares. LMR chapter 14
3	July 11th	ANOVA II	Two-way anova, interactions. LMR chapter 15
4	July 16th	Binomial Data, Logistic Regression	ELMR chapter 2 sections 2.1, 2.2, 2.3, 2.5, 2.10
5	July 18th	Count Data I: Poisson/Log Regression	ELMR chapter 3, sections 3.1 and 3.2
6	July 23rd	Count Data II: Contingency Tables	ELMR chapter 2 section 2.6; chapter 4 sections 4.1, 4.2, 4.4
7	July 25th	Midterm	
8	July 30th	Count Data II: Contingency Tables	ELMR chapter 2 section 2.6; chapter 4 sections 4.1, 4.2, 4.4
9	August 1st	Generalized Linear Models	ELMR chapter 6, sections 6.1, 6.2, 6.4
10	August 8th	Dependent Data: Linear Mixed Effects Models	ELMR chapter 8, sections 8.1, 8.2, 8.3
11	August 13th	Dependent Data: Linear Mixed Effects Models	ELMR chapter 9 sections 9.1, 9.2
12	August 14th	Exam Review	

Marking concerns

Any requests to have marked work re-evaluated must be made in writing within *one week* of the date the work was returned. You must print and fill out the form from the course webpage *in detail*, sign it, and put it in my departmental mailbox. Requests must include a detailed reason for the change that references objective fact, and must be made for legitimate perceived errors only. The following are unacceptable reasons for requesting a remark of any work:

- I feel my mark was unfair
- My friend got a better mark for the same thing
- I need a bump to get my GPA over some threshold

If you legitimately find an error, then I will happily change your mark, but in case of any ambiguity over the legitimacy of an error, I will side with the TAs over you.

Do not email me remark requests; these will be deleted with no response.

By submitting a remark request, you are agreeing to have me (the instructor) remark your entire work, change the grade up, down, or not at all, and that the result of this represents your final mark on the work and is not to be contested further.

Missed Tests

If a test is missed for a valid reason, you must submit documentation to the course instructor.

If a test is missed for a valid medical reason, submit a copy of the University of Toronto Verification of Student

Illness or Injury form to your instructor within two weeks of the test. Please **scan and email me** this form. The form is considered received when I email you back saying "Received; feel better!".

Important: The form must indicate that the degree of incapacitation on academic functioning is moderate, serious, or severe in order to be considered a valid medical reason for missing the term test. If the form indicates that the degree of incapacitation on academic functioning is negligible or mild then this will *not* be considered a valid medical reason.

If a test is missed for a valid reason then the weight of the test will be added to the final exam.

Computing

You need to use R and RStudio for this course. You can download R from CRAN: https://www.r-project.org/

You can download RStudio from https://www.rstudio.com/products/rstudio/#Desktop

Get the open-source version, which is free and runs on Windows/Mac/Linux.

Calculators

You will need a calculator. Any calculator that has logarithmic functions will be sufficient. Calculators on phones or other devices equipped to communicate with the outside world (for example, through the internet or cellular or satellite phone networks) will not be permitted during the term test and the final exam.

Online Discussion Board

This term you will have the option to use Piazza for class discussion. If you decide not to use Piazza, it will not disadvantage you in any way, and will not affect official University outcomes (e.g., grades and learning opportunities). If you choose not to opt-into Piazza, then you can ask questions or discuss course material with the instructor or TAs during office hours.

Be sure to read Piazza's Privacy Policy and Terms of Use carefully. They provide for substantial sharing and disclosure of your personal information. If you decide to participate in Piazza, only provide content that you are comfortable sharing under the terms of the Privacy Policy and Terms of Use.

https://piazza.com/utoronto.ca/summer2018/sta303sta1002/

The discussion form is for students to discuss class material with each other. Do NOT post anything related to assignment solutions.

How to communicate with your instructor

I get a lot of email, so it is important to abide by my email policy in order to ensure you receive a prompt and efficient response. You'll get a good response from me if you chat to me after lecture or in office hours. If you need to email me, make sure you are professional: full sentences, no slang like "yo prof, I wanna get the lecture notes", etc. This is good practice for your eventual transition into industry or grad school. *Make me want to reply to you.* I reserve the right to simply ignore any emails I don't like.

If you need to email me follow these steps:

- Put STA303: Student Communication in the subject line
- Start the email with your full name and student #, and "Hi Alex, …". First name is fine.
- State the purpose of your email
- Say thank you or sincerely or something that indicates the email is over
- End with your name and student number

This policy is not designed to discourage student communication- I like communicating with you, it's my job. This policy is designed to encourage *productive* student communication, by forcing you to communicate professionally.

Example email:

“”“
Hi Alex,

My name is <name>, student number <student number>, and I am a student in your STA303 class. I would like to follow up on our conversation after lecture yesterday.

<more content>

Thank you,

<name>, <student number>
“”“

Academic integrity

You are responsible for knowing the content of the University of Toronto's Code of Behaviour on Academic Matters at www.governingcouncil.utoronto.ca/policies/behaveac.htm. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact your instructor.

Accessibility needs

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom, or course materials, please contact Accessibility Services as soon as possible: accessibility.services@utoronto.ca or http://accessibility.utoronto.ca.