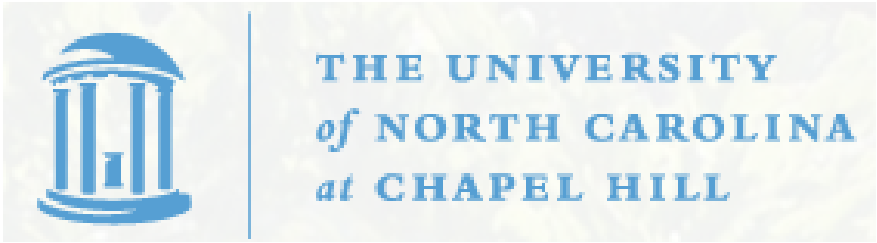
STOR 590:
ADVANCED LINEAR MODELS
Instructor: Richard L. Smith

Class Notes:

August 10, 2020



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PREREQUISITES FOR THE COURSE

1. An introductory statistics course at the level of STOR 151 or STOR 155 (should be a prerequisite to STOR 455)

2. STOR 455 or equivalent: an undergraduate-level introduction to linear models and regression, including the R statistical package (or RStudio)

3. STOR 435 - probability

4. Linear Algebra is not officially a prerequisite but it appears that every student in the class had had a course in this topic. Although the course will not require the mathematical theory of linear algebra (vector spaces etc.), I will find it useful to use matrix algebra for some derivations and to express computational formulas in a compact way.

TOPICS OF THE COURSE

1. Linear regression — assumed as a prerequisite but we will review

2. Generalized linear models

3. Random effects linear models

4. Bayesian statistics

5. Nonparametric linear models, e.g. fitting smooth curves using splines

6. The book covers some more specialized topics such as trees and neural networks — probably won't get to these but we may

OTHER REQUIREMENTS FOR THE COURSE

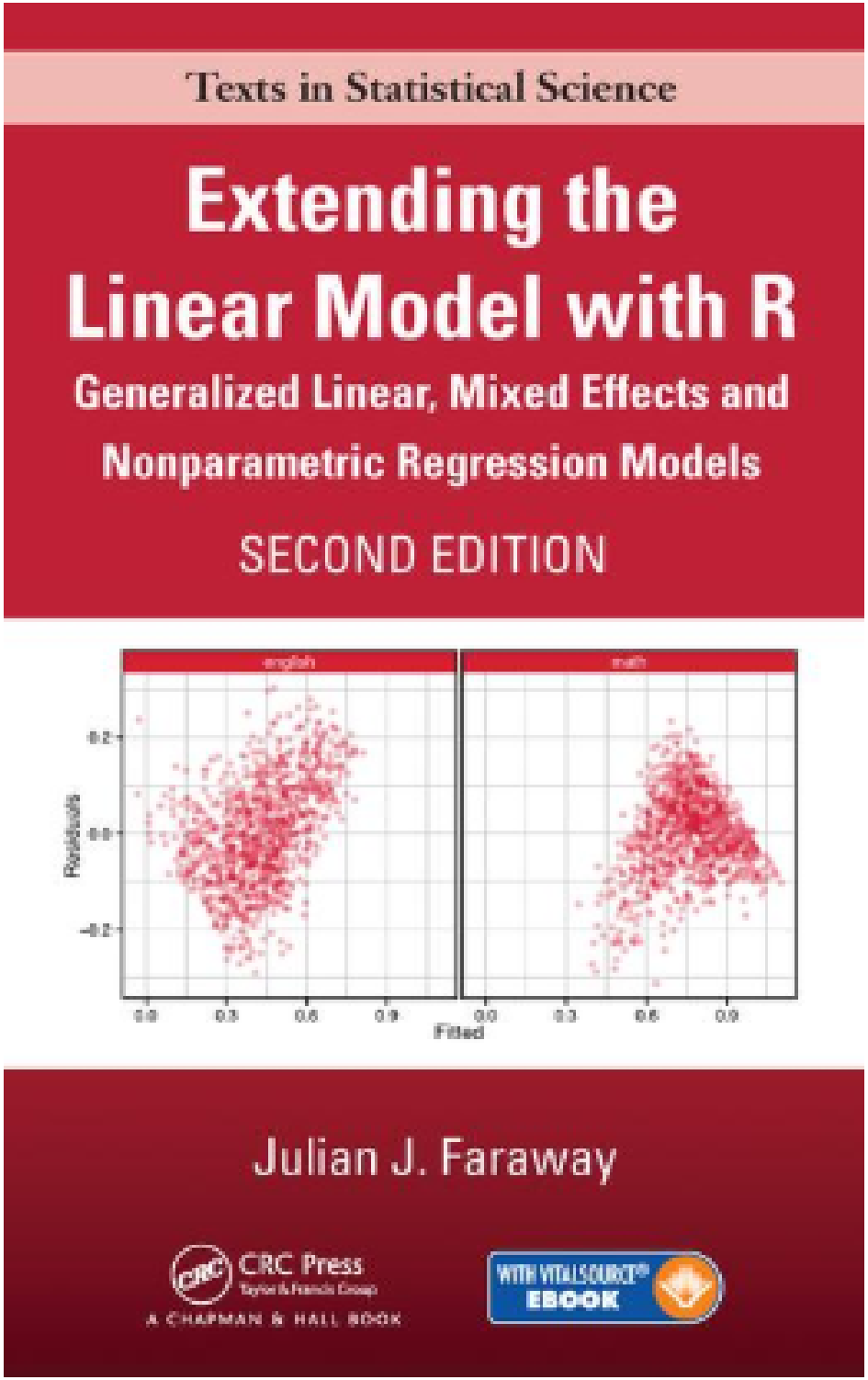
1. Text: *Extending the Linear Model with R* by Julian Faraway. Available through campus store. There is an e-book version and this would also be acceptable.

2. Make sure you get the *Second Edition.*

3. Software: use R statistical package available from `https://www.r-project.org/`.

4. Install the `faraway` package (also free — click "Install" and then "Load" from within R.)

5. RStudio also acceptable — `https://www.rstudio.com/`


Texts in Statistical Science
Extending the Linear Model with R
Generalized Linear, Mixed Effects and Nonparametric Regression Models
SECOND EDITION
english
math
Residuals
Fitted
Julian J. Faraway
CRC Press
A CHAPMAN & HALL BOOK
WITH VITALSOURCE® EBOOK

CLASS POLICIES

1. Attendance at the time class is expected, and I may use the "attendance" tool in sakai to monitor this. I will not normally penalize an occasional absence from class, but I will note if you are frequently absent. Students in different time zones are excused from synchronous attendance in class, but you are expected to view the course videos online as soon as possible after the class.

2. The class begins at 1:20 and ends at 2:10. Please do not expect me to end before 2:10.

3. If you know in advance that you will not be present or will not attend the full class, I will appreciate receiving a note about it (personal email to me).

4. Even though the class is online, please note that appropriate standards of dress and personal behavior are expected, just as if we were meeting in person.

EXAMS

1. Midterm 1, *tentatively* — posted online at 6:00 pm Sunday, September 27 and due (via sakai) at 6:00 pm Monday, September 28.

2. If you have a conflict for those dates please let me know as soon as possible. If many students have a conflict, I may reschedule the exam.

3. The final exam is intended to have a similar format but I won't fix the date until the official exam schedule is published.