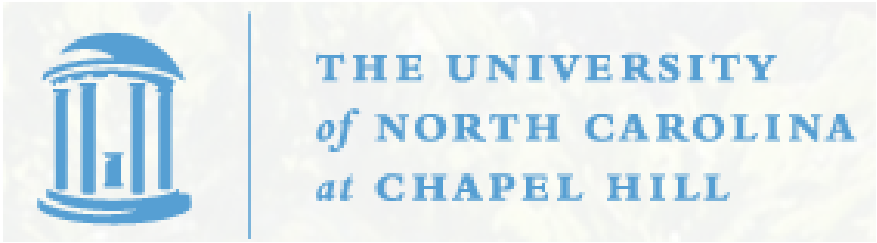
STOR 556: ADV METH DATA ANAL
Instructor: Richard L. Smith

Class Notes #1:

January 10, 2019



PREREQUISITES FOR THE COURSE

1. An introductory statistics course at the level of STOR 151 or STOR 155 (should be a prerequsite to STOR 455)
2. STOR 455 or equivalent: an undergraduate-level introduction to linear models and regression, incuding the R statistical package
   - Although it appears that every student had taken this course or a close equivalent, different students in the class had taken STOR 435 from at least four different instructors who used different texts and, in one case, a different programming language (SAS instead of R). I shall endeavor to make adjustments to allow for students' different levels of knowledge of the background material.
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. Nonparametric linear models, e.g. fitting smooth curves using splines

5. 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.

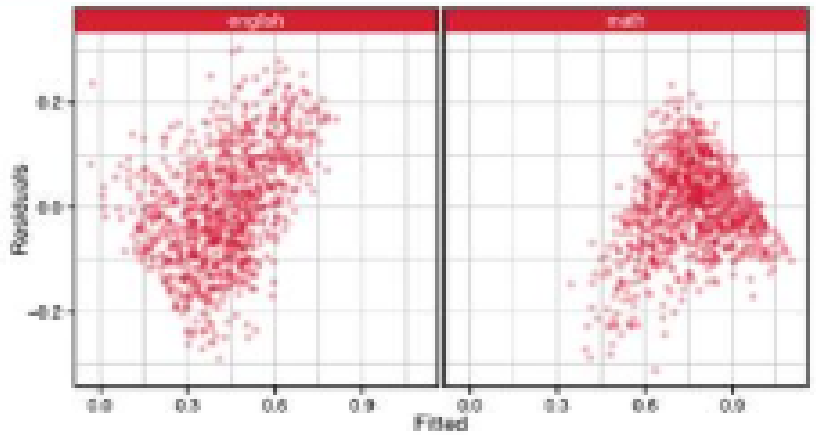
5. RStudio also acceptable — `https://www.rstudio.com/`

Texts in Statistical Science

Extending the Linear Model with R

Generalized Linear, Mixed Effects and Nonparametric Regression Models

SECOND EDITION



Julian J. Faraway

CRC Press
Taylor & Francis Group
A CHAPMAN & HALL BOOK

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