

Stats Resources

Brendan Apfeld

Here are some possible resources for learning R and calculus.

Learning R

There are a lot of online resources to learn R these days. You can definitely google just about everything, and sites like [stackoverflow](#) will be really useful. If you want a course in R, then here are some good options:

1. DataCamp's [Introduction to R](#)
2. Code School's [Try R](#)
3. Coursera/Johns Hopkins's [R Programming](#).
 - This one looks like it has a heavy academic/programming focus at the beginning before it gets into the practical stuff, whereas DataCamp and Code School are both practical from the start.

For books, there are also a lot of possibilities.¹ These books tend to be expensive, and many are not written with social scientists in mind. There is certainly much to be learned from them, but be prepared to make a real time investment.

1. Professor Jesse always recommends John Fox's *[An R Companion to Linear Regression](#)*. Unfortunately, it's rather expensive.
2. If you already know Stata and want to learn R, there's a [book](#) for that! Again, it's not exactly what you'd call cheap. . .
3. If you want some more advanced texts, then here are three, arranged in ascending complexity:
 - *[Hands-On Programming with R](#)*
 - *[Software for Data Analysis: Programming with R](#)*
 - *[Advanced R](#)* This one is free online! And though it's the most advanced, it's also written in very clear prose.

(Re)Learning Calculus

Stats II with Professor Luskin will use more math than Stats I. None of it is super-advanced, but if you struggled at all with the calculus in Stats I, then you might want to do a refresher course. Khan Academy has a lot of [calculus materials](#). Take a look at the topics if you only want to explore specific parts of calculus, or go through the courses for Differential Calculus, Integral Calculus, and Multivariate Calculus (in that order) for a more complete treatment. The idea of partial derivatives will be integral (see what I did there) to understanding the math in Stats II, so be sure to check out [that part](#) of the Multivariate Calculus course. That said, however, you will have to calculate few if any derivatives or integrals. As long as you are comfortable with the following concepts (generally what they are and why we care about them), then you are probably fine:

- Derivative
- Partial derivative
- Integral
- Limit
- Expectation (okay, not a calc concept, but know this one for sure)

¹Many of these resources come from [this](#) blog post. I came across this post through [R Bloggers](#). You may consider subscribing (maybe with your favorite RSS reader) as an additional R resource. The topics that they post are on a wide range of topics and levels.

Professor Jessee recommends the book [*Calculus Lite*](#) as a readable and approachable text on calculus.

Stats II will also use a bit of matrix algebra (also known as linear algebra). Again, Khan Academy has a [Linear Algebra course](#) that may be of interest. This course will be much more in-depth than you need to know, and you will probably cover what you *do* need to know in the extra sessions for class. Still, it might be useful to have a passing familiarity with: the concepts of scalars, vectors, matrices, matrix inverses, matrix transposes, and the determinant; basic knowledge on matrix addition, matrix multiplication, inverting and transposing matrices and finding a determinant.

Learning Other Stuff

If you're interested in learning other math/computer-related things over break, here are some thoughts. For anything programming based, my favorite starter site is [Codecademy](#). They don't have an R course, sadly, but they do have a lot of other stuff including the command line, git, and python. I've found that a lot of this (including and especially R) doesn't really make sense to me until I have a specific problem I'm facing. After a semester of statistics and coursework, though, you probably have a much better sense of the sorts of things you will have to/want to do with data on the computer.

If you want to learn more about LaTeX, [ShareLaTeX](#) offers an extensive and approachable introduction.

For more on these topics (and others) that fall under the "I'm a grad student and I want to do that and other stuff good too" category, I'd definitely recommend reading through Alex's [posts](#) (and all of the things that he links to).