

Spring 2-1-2019

BIOB 491.03: ST - Using R for Biostatistics

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BIOB 491-03 (CRN 34960) Using R for Biostatistics

Mondays 3:00 – 4:50pm in Mansfield Library 283

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Office Hours: Thursday 10:30am and Fridays 10am in Natural Sciences Building 309 and by appointment

Websites

[R project](http://www.r-project.org/) - <http://www.r-project.org/> [you can download R v 3.5.2 (Eggshell Igloo...seriously) from this site]

[CRAN](http://cran.wustl.edu/) [comprehensive R archive network] - <http://cran.wustl.edu/>

[R examples](http://www.mayin.org/ajayshah/KB/R/index.html) - <http://www.mayin.org/ajayshah/KB/R/index.html>

[Community Blogs](https://www.r-bloggers.com) - <https://www.r-bloggers.com>

[Wiki](http://openwetware.org/wiki/R_Statistics) with links to tutorials - http://openwetware.org/wiki/R_Statistics

Books

None required because there are so many good resources online. See list of R textbooks via Amazon [here](#).

Downloading and Installing R

We will use R and R studio for this class. R studio provides a more user-friendly way to use R. Although it is not required to run R, R studio will be the default way we use R for this class. Please install both R and R studio on your personal computer before class. This [video](#) should help.

Outlook

R is an increasingly popular free programming language for statistics. In this seminar, which is designed for students with little to no prior R experience, I will introduce the basics of data input and manipulation, show how to do common kinds of statistical analyses in biology (chi-sq, t tests, ANOVA and regression), discuss how to fit and evaluate models, introduce R's graphical capabilities, and lay out some of R's more useful programming aspects (how to write scripts, loops, and functions). The course will consist of lectures and demonstrations coupled with lots of hands-on coding by you. Weekly assignments will be emailed out whose answers you will email back to me. Hopefully we can go entirely paperless!

Overall Goal

Students will understand the incredible versatility R offers and will be comfortable using online resources to use R in whatever capacity they need. I do not expect students to memorize R commands. Rather I hope they know generally how to use R and can find online resources to help with specific problems.

Learning Outcomes

Upon completion of this class the student will have:

1. Gained a broad perspective of the versatility of program R as a statistical and graphing tool.
2. Gained experience in performing basic statistical analyses including but not limited to t-tests, anova, and generalized linear models.
3. Gained experience in visualizing data

Grading

Entirely credit/no credit. Homework will be assigned weekly and is due before start of next class. Each student can miss no more than 2 homework assignments without penalty. No exams or extra credit given. You will take away from this class what you put in. Therefore, I expect students to exceed the minimum requirements for passing in order to get the most out of this course.

Tentative Schedule

Week 1 (1/14) Course Overview / R Introduction

(1/21) No class—MLK Day

Week 2 (1/28) R Introduction cont. / Getting Help in R

Week 3 (2/4) Reading in and manipulating data

Week 4 (2/11) Reading in and manipulating data cont.

(2/18) No class—President's Day

Week 5 (2/25) Summarizing data

Week 6 (3/4) Visualizing/Plotting Data and Student Check in

Week 7 (3/11) Loops and Functions

Week 8 (3/18) Basic Statistical Tests (chi-squared, t-tests)

(3/25) No class—Spring Break.

Week 9 (4/1) Basic Statistical Tests (regression, ANOVA)

Week 10 (4/8) Spatial Data

Week 11 (4/15) Density Estimation

Week 12 (4/22) Home Range Estimation

**** Schedule Subject To Change ****

Policy for Accommodating Disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.