Course Syllabus

BIOST 562, Winter 2017
Computational Skills for Biostatistics II

Syllabus

Instructor: Timothy Thornton, Associate Professor of Biostatistics
Office: HSB F652
Email: tathornt@uw.edu

Time and Place: Thursdays 2:00pm - 2:50pm HSB K069
Office hours: Monday 2:00pm - 2:50pm (or by appointment)
Class Web Pages: https://canvas.uw.edu/courses/1097543

Course Objectives

This course is about programming and other computing skills for biostatistics. It is a continuation of BOST 561, Computational Skills in Biostatistics I, and is intended as an optional "add-on" course to BOST 515 - in which students are introduced to R commands for multivariate regression, and many examples using those commands. Bioest 562 provides a more mathematical look of Biostat 518 analyses, using ideas from Stat 512/3, and introduces more sophisticated uses of R, and other programming techniques and tools.

Prerequisites: Graduate students in Biostatistics/Statistics can register for the course, however, familiarity with statistical analysis and matrix algebra would be useful. Contact the instructor for permission to take the course if you are not a graduate student in Biostat/Stat and if you are not certain whether this course is right for you.

Computing Software: R

R is a freely available computing package. It is available on departmental computers. It can also be downloaded on your personal computer from http://cran.r-project.org/

Text: There are a number of good textbooks on using R in different classes of statistical analyses, ranging from linear models, to Bayesian statistics and survey sampling. While you are welcome (and encouraged) to consult these books, the combination of lecture notes and class discussions are designed to be self-contained and there is no official textbook for the course.

Class Notes: Slides for each lecture will be posted on the webpage before the class so that you can print them and bring your own copy. Hard copies will not be provided by the instructor.

Assessment: Homework are assigned ~weekly (announced in class and on the webpage). Homeworks will consist of R programming assignments and you need to submit your solutions (as instructed in each HW) electronically via Canvas.
**Grading:** CR/NC

**Important Notes:**

1. Class material, including lecture notes, homework assignments, and other course-related information will be posted on the webpage. Printed course materials will not be provided by the instructor. Please check the webpage regularly and print/copy the notes.

2. The instructor reserves the right to modify the course plan and the syllabus as conditions require.

3. Questions and discussions are welcome, and encouraged throughout the class; keep in mind that if there is something that is not clear to you, it most likely is unclear to others as well.

**Tentative Course Topics:**

1. Regression with multiple covariates/predictors
2. Robust standard errors, and making few assumptions
3. Inference for more than 1 parameter
4. Matrix Calculations in R
5. Model Selection Techniques
6. Intro to Java
7. Intro to Cloud Computing
8. Data Management and Manipulation in R
9. Convex Optimization

**Assignments Summary:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
<th>Due by</th>
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<tr>
<td>Thu Jan 12, 2017</td>
<td>Homework 1 (<a href="https://canvas.uw.edu/courses/1097543/assignments/3563665">https://canvas.uw.edu/courses/1097543/assignments/3563665</a>)</td>
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<td>Thu Jan 19, 2017</td>
<td>Homework 2 (<a href="https://canvas.uw.edu/courses/1097543/assignments/3581973">https://canvas.uw.edu/courses/1097543/assignments/3581973</a>)</td>
<td>12pm</td>
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