

EPI 853B: Statistical Computing

Instructor: Gustavo de los Campos, 909 Fee Road, Room B637

Email: gustavoc@msu.edu

Time/Place: T/Tr 10:20am - 11:40am A131 Fee Hall

Websites:

Lab: <http://quantgen.github.io/>

Course website: <https://github.com/gdlc/EPI853B>

Office Hours: T/Tr 9:00am-10:00 am 637 Fee Hall.

Prerequisites: STT 442 or equivalent courses.

Grading: Final grades will be based on homework (30%), one in class exam (40%) and one final project (30%).

Score (5)	<50	50-59	60-69	70-74	75-79	80-84	85-89	≥ 90
Grade	0	1	1.5	2	2.5	3	3.5	4

Course Description:

In this course, we will cover computational methods commonly used in statistics, including algorithms used for fitting and non-linear regressions, maximum likelihood estimation, simulation of random variables, bootstrap, cross-validation and algorithms for implementing high dimensional regressions.

Software: The course will be mostly based on [R](#). If time permits we will also work with [Julia](#).

Course Content: visit the course website (<https://github.com/gdlc/EPI853B>) for a detailed list of topics that will be covered.

Approach: Although the focus of the course is on computational methods, for each topic we will first describe the problem from a statistical perspective. If they exist, exact analytical solutions will be discussed and implemented. Otherwise numerical methods will be presented. Derivations will be presented in class and students are expected to take

their own notes. Scripts for computations will be developed in class and a summary will be posted in this repository. Students are expected to bring their own laptops. If you do not have access to a laptop, please check with the instructor to get access to one.

Evaluation: The evaluation will be based on HW (number to be determined) and two in-class exams.

Textbook: There is no required textbook. We do not have a required textbook. The following are very good textbooks that will guide you learning about statistical analyses in R.

- Introductory Statistics with R (Statistics and Computing) 2nd Edition by Peter Daalgard.
- Modern Applied Statistics with S. by W.N. Venables and B.D. Ripley.
- An Introduction to Statistical Learning with Applications in R, by J. Gareth, D. Witten, T. Hastie and R. Tibshirani.

Instructor: Gustavo de los Campos (gustavoc@msu.edu)

Academic Honesty: The Department of Epidemiology and Biostatistics adheres to the policies of academic honesty as specified in the General Student Regulations 1.0, Protection of Scholarships and Grades, and in the All-University of Integrity of scholarship and Grades which are included in Spartan Life: Student Handbook and Resource Guide. Students who plagiarize will receive a grade 0.0 on the homework, exam or quiz.

ADA: To arrange for accommodation a student should contact the Resource Center for People with Disabilities at <http://www.rcpd.msu.edu/> or (517)353-9642

Disclaimer: Changes on the syllabus/important dates will be announced in class and on the course web site. It is students' responsibility to keep up with any changed policies and assignments.