

PUBHLTH 597 (1 credit)
Introduction to Statistical Computing with R
Fall 2014 :: W 1:25-2:15 :: Arnold 120

INSTRUCTOR

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Office Hours: TBD
Teaching assistant: TBD

CLASS RESOURCES

Course Website

[Visit site on GitHub](#)

Piazza discussion group

[Signup page](#)

[Group website](#)

Required Textbook

Daalgard, Peter. (2008) *Introductory Statistics with R*, 2nd edition. [free download via UMass library]

Software (free downloads)

R :: [r-project.org](#) (or just Google "r")

RStudio :: [rstudio.org](#)

PREREQUISITES

None.

COURSE GOALS

The aim of this course is to provide students a foundational training in the modern tools of statistical computing and reproducible research. In particular, we will focus on learning the R programming language, the RMarkdown syntax, and the git version control system. Students will learn how to manipulate, summarize, analyze, and visualize data using R. This course will focus more on the computing than on the statistics, but students will be exposed to statistical concepts and strategies such as sampling, simulation, expected values, etc... along the way.

LEARNING GOALS (*By the end of the course students will be able to...*)

- describe the history and role of R in the open-source software movement,
- perform basic data management tasks in R,
- summarize and visualize data using R,
- run simulation studies,
- write reproducible statistical analysis reports using RMarkdown,
- use git to create version-controlled repositories for source code,
- use GitHub to store, share, and distribute code.

EXPECTATIONS

Things you should expect from me:

- timely feedback on assignments and quizzes
- response to emailed questions in < 2 working days (often sooner)
- attention to your questions related to coursework during office hours
- instruction in how to write, research, and debug R code

Things you should not expect from me:

- time for frequent non-office hour drop-in questions
- comments on a research project that is unrelated to your coursework
- writing your code for you or *extensive* debugging of your code

TYPES OF ASSIGNMENTS AND ACTIVITIES, WITH GRADE CONTRIBUTIONS

Quizzes (50%): There will be frequent quizzes, some announced, some unannounced. Mostly, they will be short (less than 10 minutes), in-class quizzes that will test your understanding of material covered in the course up to that time, but focusing largely on recent material. The quizzes will not be designed to be difficult, as they are largely intended to evaluate participation, engagement with the material, and attendance. Quizzes will take many forms: short answer or multiple choice questions, an in-class survey of results of a take-home lab assignment, etc... I will drop your lowest two quiz scores when calculating your final grade.

Participation/citizenship (10%) : I consider course citizenship to be a vital part of your grade. A few of the characteristics of good class citizens are: attending all course meetings, using office hours, asking questions, offering to answer questions, actively listening when others are talking, and posting to online discussion forums, among others. Citizenship is more a function of quality than quantity. Note that the "default" citizenship score is 5 out of 10, which allows students who actively and productively contribute to class to substantially increase their grade. Please note that good citizenship is different from "talking a lot," and it is quite possible to earn a low citizenship score because you fail to let others contribute.

Homework (40%): There will be occasional homework assignments. Some of them will be graded as complete/incomplete, others will receive more detailed feedback and grading. Late assignments will not be accepted under any circumstances. Your lowest homework grade will be dropped.

Extra Credit: Students will receive a single point in their final grade for each error corrected in course materials prepared by the instructor. All corrections must be submitted as a pull request on GitHub. Additionally, if you send me an email with "I read the syllabus" as the subject line by the beginning of the second class, you will receive two points of extra credit on your final grade.

COURSE POLICIES

Collaboration on homework is expected and encouraged, although you must write up your own assignment. No copying or cutting and pasting. Quizzes must be completed without assistance from your classmates.

Late assignments: Completing homework assignments on time will be vital to not falling behind in this course. It is expected that you hand in assignments on time. Late assignments will not be accepted.

Make-up quizzes: Make-ups will not be allowed. I will drop the two lowest quiz scores when calculating this portion of your grade. Quizzes may be unannounced.

Attendance is required. Absences (excused or not) will impact your participation grade.

All mobile devices that can/will be distracting to you or others during class must be turned off at the start of class and may not be used during class time.

FORMAL CEPH COURSE COMPETENCIES

- Describe the role biostatistics serves in public health.
- Describe conceptual frameworks (statistical literacy) in biostatistics
- Apply biostatistical methods to the design of studies in public health.
- Use computers to appropriately store, manage, manipulate and process data for a research study using modern software.
- Apply descriptive techniques commonly used to summarize public health data.
- Describe the basic concepts of probability, random variation and selected, commonly used, probability distributions.
- Select and perform the appropriate descriptive and inferential statistical methods in selected basic study design settings.
- Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics.
- Develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.

ACADEMIC HONESTY POLICY STATEMENT Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst.

Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. The procedures outlined below are intended to provide an efficient and orderly process by which action may be taken if it appears that academic dishonesty has occurred and by which students may appeal such actions.

Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent. For more information about what constitutes academic dishonesty, please see the [Dean of Students website](#).

DISABILITY STATEMENT The University of Massachusetts Amherst is committed to making reasonable, effective and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you are in need of accommodation for a documented disability, register with Disability Services to have an accommodation letter sent to your faculty. It is your responsibility to initiate these services and to communicate with faculty ahead of time to manage accommodations in a timely manner. For more information, consult the [Disability Services website](#).