



Applied Mathematics and Statistics 553.283
Introduction to R
Intersession, 2022 (1 credit, Q)

Instructor

Joshua Agterberg
Email: jagterberg@jhu.edu
Office hours:
Wednesday 11AM-12PM
Thursday 2PM-3PM
By appointment, via email
Office: <https://wse.zoom.us/my/jagterberg>

Teaching Assistants

Cherlin Zhu
Email: czhu27@jhu.edu
Zachary Pisano
Email: zpisano1@jhu.edu
Tianyi Chen
Email: tchen94@jh.edu
Anirrudh Ramesh
Email: aramesh6@jhu.edu

Meetings

TW, 1:30–4:30 pm
Meeting Link:
<https://wse.zoom.us/j/94399984653?pwd=R3J3SW9DWkwyMyttaUJUL0NGOXhSQ09>
Meeting ID: 943 9998 4653
Passcode: r_is_great

Textbook

Recommended: John Verzani, *Using R for Introductory Statistics*, Chapman and Hall (2005).

Online Resources

Please log in to Blackboard for all materials related to this course.

Course Information

- This is an introductory course in R for both undergraduate and graduate students. R is a programming language and software environment that provides a wide variety of statistical and graphical techniques, including linear and nonlinear modeling, classical statistical tests, time-series analysis, etc. We will discuss data structures, data entry and manipulation, graphical procedures, statistical models, and programming in R. No previous programming experience is required.
- **Prerequisites**
None
- **Elective**

Course Goals

Specific Outcomes for this course are that

- Students will learn the basic skills necessary to program with R.
- Students will learn how to use R for basic statistical analysis.

Course Topics/Schedule

- 1/4 Syllabus; history of R; installation; working directories; R as a calculator; basic syntax and functions
- 1/5 Univariate data; basic statistics; boxplots and histograms; multivariate data; scatterplots and quantile-quantile plots; basic `plot` function
- 1/11 `ggplot2`; linear models and nonlinear models; hypothesis testing
- 1/12: programming in R; simulations
- 1/18: Advanced R data structures and programming
- 1/19: TBD

Course Expectations & Grading

- **Homework (100%):** There are five (5) homework assignments each worth 20% of your final grade. Assignments consist of problem sets and short answers relevant to the most recent material in lecture. Each assignment is due to Blackboard within 48 hours after the beginning of the lecture it is assigned. For example, Homework 1 will be assigned in the second lecture on Wednesday at 1:30PM EST, so it will be due by Friday at 1:30PM EST. Owing to the small number of assignments late homework will be graded at three-quarters-credit. Extensions will be granted provided there is enough advance notice. When requesting an extension, please email me and cc the TAs.

Note on Assignment Submissions:

Assignments can be submitted digitally via Blackboard or if necessary, by email to the instructor (cc'ing the TAs). The preferred form of submission is submitting to Blackboard a copy of your assignment consisting of code immediately preceded or followed by short answers pertinent to that code. (The easiest way to do this is to clear your console, run the whole homework script line by line, and copy and paste

the final output into a word document. Comments can delineate each problem.) Regardless of how you submit your work, **all code must be typed and commented, and any handwritten short answers must be legible.**

Key Dates

There are no key dates for this course.

Assignments & Readings

Assignments and readings will be posted to Blackboard.

Ethics

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition.

In addition, the specific ethics guidelines for this course are:

(1) You are permitted to discuss the assignments with your classmates. However, your submissions should reflect only your understanding of the material.

Report any violations you witness to the instructor.

You can find more information about university misconduct policies on the web at these sites:

- For undergraduates: <http://e-catalog.jhu.edu/undergrad-students/student-life-policies/>
- For graduate students: <http://e-catalog.jhu.edu/grad-students/graduate-specific-policies/>

Personal Wellbeing

- All students with disabilities who require accommodations for this course should contact me at their earliest convenience to discuss their specific needs. If you have a documented disability, you must be registered with the JHU Office for Student Disability Services (385 Garland Hall; 410-516-4720; <http://web.jhu.edu/disabilities/>) to receive accommodations.
- If you are struggling with anxiety, stress, depression or other mental health related concerns, please consider visiting the JHU Counseling Center. If you are concerned about a friend, please encourage that person to seek out our services. The Counseling Center is located at 3003 North Charles Street in Suite S-200 and can be reached at 410-516-8278 and online at <http://studentaffairs.jhu.edu/counselingcenter/>

Classroom Climate

I am committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. Everyone here has the right

to be treated with dignity and respect. I believe fostering an inclusive climate is important because research and my experience show that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes. Please join me in creating a welcoming and vibrant classroom climate. Note that you should expect to be challenged intellectually by me, the TAs, and your peers, and at times this may feel uncomfortable. Indeed, it can be helpful to be pushed sometimes in order to learn and grow. But at no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity.

If you ever have concerns in this course about harassment, discrimination, or any unequal treatment, or if you seek accommodations or resources, I invite you to share directly with me or the TAs. I promise that we will take your communication seriously and to seek mutually acceptable resolutions and accommodations. Reporting will never impact your course grade. You may also share concerns with the department chair (Fadil Santosa), the Director of Undergraduate Studies (Donniell Fishkind, df@jhu.edu), the Assistant Dean for Diversity and Inclusion (Darlene Saporu, dsaporu@jhu.edu), or the Office of Institutional Equity (oi@jhu.edu). In handling reports, people will protect your privacy as much as possible, but faculty and staff are required to officially report information for some cases (e.g. sexual harassment).