

BSTA103: Algorithms Lab - II

About the Course**Instructor** Graham Casey GibsonEmail: gcgibson@umass.eduOffice Coordinates: Online (<https://umass-amherst.zoom.us/j/3474201588>) or STEPS 109 (prof m)

Office Hours: Online from 1:30pm to 2:30pm and an in-person to be voted on by students | by Appt.

Class times Thurs 07:15pm - 09:55pm / Friday 10:45am-01:25pm in Coppee Hall 103 or online**Course Website** I will update course website at https://thomasmcandrew.com/classes/2021F_AlgLAB2/public/ regularly with lecture notes and materials used in class. Lab assignments will be distributed on Course Site.**Description** Students will apply regression and machine learning models learned in BSTA101 Population Health Data Science II to health datasets using Python3/R. Datasets that students will study include: the National Health and Nutrition Examination Survey, influenza-like illness and confirmed positive cases of COVID-19 tracked by the Centers for Disease Control and Prevention, and the National Health Interview Survey. Lab is to be taken concurrently with lecture (BSTA101 Population Health Data Science II)

We will plan to cover the following topics:

- Matrix Algebra
- Random variables and common distributions
- The Maximum Likelihood Approach and learning from data
- Simple Linear Regression
- Multiple Linear Regression
- Logistic Regression
- Poisson Regression
- Generalized Linear Models
- Quasi-likelihood
- Tree-based learning and KNN regression

Textbook We will follow notes provided on the website.

Time commitment I recommend budgeting approximately three out-of-class hours for every in-class hour to complete the reading, assignments, and homework. Six hours per week spent on class should be enough time to complete class requirements. If you spend more than six hours per week on a regular basis, I encourage you to check in with me.

Scheduling an appointment Students can schedule times for us to meet. I am happy to meet with a student one on one or as a group of 2-10 students. Appointments should be scheduled in advance and not last minute.

Policies

Attendance Your attendance is crucial. If you are sick or otherwise cannot attend class, please let me know and stay home and rest.

Collaboration Much of this course will operate on a collaborative basis, and you are expected and encouraged to work together with a partner or in small groups to study and complete lab assignments. However, every word that you write must be your own. Copying and pasting sentences, code from another student is not acceptable and will receive no credit or a penalty. All students, staff, and faculty are bound by the Lehigh University Honor Code.

To sum up: On homeworks I want you to work together, but you must write up your answers yourself. Dishonesty, plagiarism, etc., will be reported.

Technology

Computing We will use R throughout this course to illustrate statistical concepts. Students can access course materials and an implementation of R (and of Python) here = <https://jupyter.cc.lehigh.edu/> .

To connect to the above URL when off campus, students must download a VPN client here <https://lts.lehigh.edu/services/vpn>.

Assignments

Your grade for this course will be an average of scores from several labs:

Item	Weight
Participation	7%
Lab Assignments	93%

Homework Lab assignments will be due one week from the date that they are assigned.

A late assignment will receive a reduced grade according to the following formula:

$$f(\text{grade, number of days late}) = \text{grade} \cdot e^{-0.35 \cdot \text{number of days late}}$$

Discussion about grades Students are welcome to discuss how their assignments were graded. However, students have one week to discuss grades with the instructor after which grades are final.

Grading When grading your written work, I am looking for solutions that are technically correct and reasoning that is clearly explained. *Numerically correct answers, alone, are not sufficient* on assignments. Neatness and organization are valued, with brief, clear answers that explain your thinking. If I cannot read or follow your work, I cannot give you full credit for it.

Accommodations for Students with Disabilities Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations at Lehigh should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at indss@lehigh.edu, or online at <https://studentaffairs.lehigh.edu/disabilities>.

The Principles of Our Equitable Community: Lehigh University endorses [The Principles of Our Equitable Community](#). We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.