Math 21: Introduction to Statistics

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Class Time: Monday, Wednesday 1:30pm-2:45pm, Paige Hall, Terrace Room
Term: Spring 2020
Office Hours: TBA
Course Website: `https://canvas.tufts.edu/courses/18702`

Prerequisites: Comfort with high school algebra. In particular, you do **not** need to have any prior coding experience.

Course Description: We will cover descriptive data analysis, basic probabilistic and combinatorial reasoning, probability distributions, estimation, regression analysis, and hypothesis testing. We'll also cover the basics of computing in R. At the end of the course, students will be have an understanding of these topics and how to apply them. Students will also gain experience in communicating mathematics.

Textbook: The official book for the course is *Learning Statistics with R* by Danielle Navarro. It is available for free here:

`https://learningstatisticswithr.com`

I will also post the PDF on the canvas site. Notes may also occasionally be distributed to supplement the text.

Using R: Part of this course will be an introduction to using R. R is a statistical computing program that makes it easy to perform statistical analysis and make graphics. I am not assuming that anyone has any computing experience, we'll cover the basics in class together.

Assessment: There will be two in-class midterm exams (tentatively scheduled for February 12 and April 30), a final exam, and a project. The project will be conducted over the whole semester; more details will be provided in class. In short, you will pick your own data set and conduct a statistical analysis, synthesizing all the skills learned in class. If you keep up with all the homework assignments, the project should not seem daunting as all the analysis will be very similar to problems you have already worked! Further, every week there will be a two-part homework assignment. One part will consist of questions about topics from class that week, the second part will consist of questions which require the use of R. **Late homework will not be accepted for any reason**, *but* your lowest two homework grades will be dropped from the final grade. Please talk to the instructor if there are extenuating circumstances impacting your ability to turn in the homework.

Regarding homework: I encourage you to discuss homework problems with your peers, but you must write your final solutions by yourself (and be sure to say who you worked with). It's very easy to convince yourself you know how to do a problem while discussing it with others and later realize you don't fully grasp something.

Finally, **math is hard!** The math community is pretty guilty of reinforcing the notion that some people are "math people" and the rest are not; this is not at all the case! You should expect to struggle at first with new mathematics, that feeling of struggling often goes hand-in-hand with learning and growth.

Computational Aids: I don't care if you use a calculator on your homework, though I will deliberately write questions that can be solved without them. You're also welcome to use R on non-coding problems to compute or check your answers. The most important thing though is that you clearly write out what you're doing. Just writing down some number from a calculator will not get you any points. You may **not** use calculators or R on the exams, but you will be allowed to have a formula sheet of your own creation.

Grading: Your final grade will be given by the following:

$$(0.25)(\text{Homework}) + (0.2)(\text{Exam 1}) + (0.2)(\text{Exam 2}) + (0.25)(\text{Final}) + (0.1)(\text{Project})$$

I do not have predetermined grade cutoffs, but they will be set no higher than the following: A+ (98 and above), A (93-97), A-(90-92), B+ (87-89), B (83-86), B-(80-82), C+ (77-79), C (73-76), C-(70-72), D+ (67-69), D (63-66), D-(60-62), F (below 60). This means, for example, if you get an 85 in the class, your grade will be no lower than a B.

Office Hours: I will have two office hours every week (times TBA). You are welcome to come by my office at these times to ask me questions about lecture, homework problems, R questions, and topics from the course. Please remember though that *office hours are not a substitute for coming to lecture.*

Seriously, office hours are one of my favorite parts of teaching; I'll be delighted to talk to you about any aspect of the course provided you've already made a good faith effort to understand the material.

Important Dates: Last day to add a course: 1/29, Last day to drop without a W: 2/19, Last day to drop with a W: 4/1.

Class Environment: I am committed to creating a learning environment in which all students may learn comfortably and productively. Moreover, the class space we will all share should be an environment that respects a diversity of perspectives, experiences and identities. Please feel free to approach me regarding any issues impacting your experience in my class either in person, via email, or anonymously to my mailbox in the math department building. If you prefer to speak to someone outside our class, you can approach the

math department administration.

Student Accessibility Services: Tufts is committed to providing equal access and support to all qualified students through the provision of reasonable accommodations so that each student may fully participate in the Tufts experience. If you have a disability that requires reasonable accommodations, please contact the Student Accessibility Services office *at the beginning of the term* at *Accessibility@tufts.edu* or 617-627-4539 to make an appointment with an SAS representative to determine appropriate accommodations.

NB: This section of Math 21 is not coordinated with other sections of Math 21, so you cannot attend other time blocks.