# Probability and Statistics with Computing (MATH 324)


## Luella Fu


T/Th 5-6:15 pm
Thornton Hall 326


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### Who am I as your instructor?

Welcome to the class! My name is Luella Fu, and my pronouns are she, her, and hers. I am an assistant professor of Mathematics working on statistics for the kind of yes/no decisions that come up in finding fraud or genes associated with cancer. Because I think general learning skills are useful for your life, my grading tends to reward the thoroughness of your efforts, your ability to learn from mistakes, and your effort to study. On the statistics side, I value your ability to interpret problems practically. I especially encourage you to ask for help early. This will aid your learning, help you succeed, and reduce your stress.

### What is this class about?

This class lays a base of knowledge that is useful for anyone who may work with data. Data often shows up when you don't expect it. It can be used to strengthen your point of view or to assess the outcomes of your experiments in science or the success of your apps in web development. Data retains qualities of the people and systems it comes from, and so we try to uncover those hidden qualities to better understand people and systems. A major difficulty in data is its randomness, so our course centers on modelling randomness (through probability models) and providing information (using descriptive and inferential statistics) despite randomness.

### LEARNING OBJECTIVES

Students who actively participate in the course will be able to answer "How do you…"

- ☐ look at data?
- ☐ compute useful numbers from data and interpret their meaning?
- ☐ represent an outcome before it happens?
- ☐ model probabilities like those found in lotteries?
- ☐ reduce the chances of making mistakes when deciding yes/no?
- ☐ convey your level of certainty about your educated guess?
- ☐ Use programming in R to help you analyze these things?

### COURSE COMPONENTS

| | |
|---|---|
| 0. Calculus II prerequisite | |
| 0. Previous coding background | |
| 1. Class participation | 10% |
| 2. Computing Projects | 15% |
| 3. HW Quizzes | 25% |
| 4. Midterm | 25% |
| 5. Final | 25% |

### MATERIALS

1. iLearn (link)
2. R and R Studio (link)
3. Jay L. Devore, *Probability and Statistics for Engineering and the Sciences*, any edition. (I will use the 9th edition: ebook $27.49, hardcover $200. 7th edition used hardcover: <$10.) Homework posted on iLearn.

### TUTORING

1. Student Tutoring THH 426
2. LAC: https://lac.sfsu.edu/

### HEALTH & ADVISING

- wellness.sfsu.edu
- http://basicneeds.sfsu.edu/
- COSE Student Success Center

### FINAL EXAM:

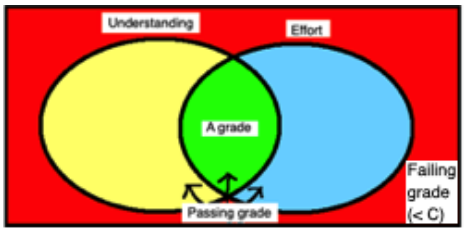
Tuesday 5/21 4-6:15 pm

### COURSE CALENDAR:

A tentative schedule with dates for homework, quizzes, and the midterm is on iLearn.

## What will I need to do to be successful?

In light of the fact that this course is required for many of you, this course is designed so that you can pass with either understanding or effort and do extremely well with both:




Understanding is gained by thinking about the material and practicing. It is both conceptual, as in, do you understand the nature of statistics? and mechanical: can you produce the numbers?

Effort takes many forms: come to all classes, do all the homework, ask questions, go to the LAC or math department for tutoring, come to office hours, study the book, and look over mistakes you have made in the past to learn from them. I promise this effort is not wasted for your success in this class.

## What do I expect of you?

First, so that you can put in the effort you need to achieve what you want, I hope that you know your personal balance between how much work you have time for and the level of success you aspire to.

Second, research shows that when students learn from one another, they learn better. To give you this kind of learning experience, I encourage you to attend every class. Class work may not be made up due to the valuable nature of community collaboration and class participation. Deadlines are also firm but if you are sick, please let me know ahead of time so we can plan reasonable accommodations ahead.

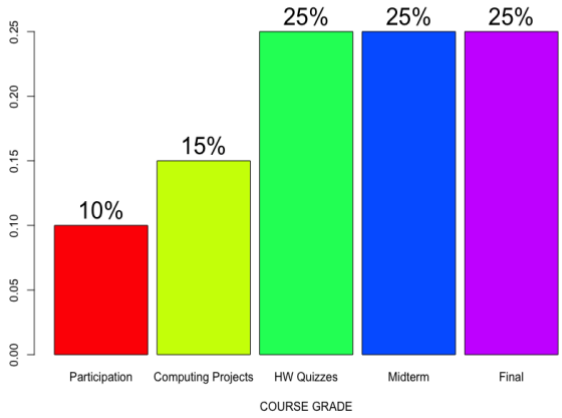
Above all, our ethical habits are important to maintain and develop because we carry them with us beyond school. Freely work together on homework and for study, but you must communicate your solutions in your own words. It is not ethical or thoughtful to copy others' work. You will also learn better if you try to explain in your own words. We have many resources to help you when you get stuck. You will receive a 0 on copied work the first time, and 0 on the entire assignment the second time. You will also be reported to the Office of Student Conduct after the first time. Arguing a 0 when the evidence is obvious will also result in a 20% deduction on the next assignment.

## What can you expect of me?

I welcome your questions. I will listen to your comments seriously and try to balance the needs of this course with your life needs as much as possible. I will respond to iLearn and email within 24 hours. Though math is learned ultimately by doing. I try to use a learning model of "I do, we do, you do" to guide you as much as our class time allows.

## How will I be graded? What kinds of assignments/exams are there in this class?

Grading components are designed to make use of many different learning styles (please zoom in):




Participation (10%) has 2 parts:

1. In-class pair activities (5%)
2. iLearn & work ethic (5%)

Computing projects (15%):

3 assignments with a mix of coding, real data, and simulation in R.

HW quizzes (25%) have 4 parts:

1. HW (5 points)
2. Graded Q (80 points)
3. Peer-Graded Q (5 points)
4. Grading (10 points)

Quizzes can be "reassessed" for 50% of your #2 points back. Tutoring before next quiz gives you 25% of your #2 points back.

Your cumulative grade at the end of the course will be a percent where roughly

| | | | | | |
|---|---|---|---|---|---|
| 93-100% | A | 90-92% | A- | 87-89% | B+ |
| 83-87% | B | 80-82% | B- | 77-79% | C+ |
| 73-76% | C | 70-72% | C- | 65-69% | D+ |
| 60-64% | D | 54-60% | D- | 0-53% | F |

## STUDENT DISCLOSURES OF SEXUAL VIOLENCE

SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the Title IX Coordinator by completing the report form available at http://titleix.sfsu.edu, emailing vpsaem@sfsu.edu or calling 338-2032.

**To disclose any such violence confidentially, contact:**

1. The SAFE Place - (415) 338-2208; http://www.sfsu.edu/~safe_plc/
2. Counseling and Psychological Services Center - (415) 338-2208; http://psyservs.sfsu.edu/
3. For more information on your rights and available resources: http://titleix.sfsu.edu

## DISABILITY ACCESS

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor early in the semester. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/415-338-2472, video phone/415-335-7210) or by email (dprc@sfsu.edu).