LS 40, Statistics of Biological Systems  
Winter 2020  
Lectures: Kaplan 135, TR 3:30-4:45 pm  
Labs: W sections meet in Young 4340, R sections in Young 4346

Instructor: Jane Shevtsov  
Email: jaia@ucla.edu  
Office: Hershey 117  
Office Hours: Tuesdays 1:30-2:30 pm and Wednesdays 3:30-4:30 pm. We can also meet at your convenience. Talk to me or email to set up a time.  
Course Website: https://ccle.ucla.edu/course/view/20F-LIFESCI40-1  
Lecture Assistant: Steven Liu  
Teaching Assistants: Annie Bratcher, Ashley Van Reynolds, Kristin McCully, Xinyue Liu

Course Description: Designed for life sciences students. Introduction to statistics, with emphasis on computer simulation of chance probabilities as a replacement for the traditional formula-based approach. Simulations allow for deeper understanding of statistical concepts and are applicable to a wider class of distributions and estimators. We will be using the programming language Python (which Sage is based on) to carry out statistical simulations and apply them to analyzing biological data while gaining understanding of probability, distributions, confidence intervals, hypothesis testing, statistical independence, linear regression, multiple-group comparisons, and statistical power. Students will learn to visualize, analyze and communicate results of biological data through hands-on practice in the computational laboratory. Prerequisite: LS 30A.

Textbook:  
- Understanding Data by Alan Garfinkel and Yina Guo, a textbook being developed specifically for this course. Chapters will be posted on CCLE.  
- Other readings will be made available to you on CCLE.

Grading: Your grade will be computed based on the following two schemes and you will get whatever grade is higher. Grading is not competitive.

<table>
<thead>
<tr>
<th>Scheme 1</th>
<th>Scheme 2</th>
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<tbody>
<tr>
<td>Homework: 25%</td>
<td>Homework: 25%</td>
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<tr>
<td>Midterm exam: 25%</td>
<td>Final exam: 75%</td>
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<td>Final exam: 50%</td>
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If necessary, I may change the grading system. If this happens, I will announce the change in class and on the course website.

Exam Schedule: The exam schedule is as follows:  
- Midterm: Monday, February 10, 6:00-7:50pm  
- Final: Thursday, March 19, 3:00-6:00 pm

If you absolutely cannot make one of the exams due to a conflict with another class, contact me ASAP.

Clickers: We will use clickers in this class to check your understanding and give you a chance to think about the material. You will need to bring an iClicker 2 to class (an older
iClicker Plus should also work). Please register your iClicker on the course website.

**Homework:** Since statistics is about analyzing data, which cannot be fully tested on an exam, homework will count for 25% of your grade, 10% completion and 15% correctness of specified problems. Collaboration is strongly encouraged; just make sure to give your collaborators credit (this is standard practice in science) and write up the answers in your own words. It is to your definite advantage to work hard on the homework, as this will help you tremendously on exams.

**Cheating:** If you decide to cheat, the primary effect is that you will be a cheater. If caught, you will be reported to the Dean of Students for punishment. However, I'd much rather have you be too proud to cheat than too scared to cheat.

**Disability Accommodations:** I am always happy to discuss any disability-related needs. Please talk to me after class or send me an email. For test-taking, note taking and other accommodations and resources, contact the Center for Accessible Education (CAE) at (310) 825-1501 or in person at Murphy Hall A255. When possible, you should contact the CAE within the first two weeks of the term, as reasonable notice is needed to coordinate accommodations. For more information, visit www.caie.ucla.edu.

**Laptop Policy:** We like technology, but there is now ample research showing that taking notes on a laptop is much less beneficial than doing so by hand. (It also doesn't work well in a class where we will use diagrams and mathematical notation a lot.) In addition to the ever-present temptation to go on Facebook, laptops make it easy to type down everything the instructor says instead of summarizing it, but looking for key points and summarizing are some of the most important benefits of taking notes. Therefore, *laptops are strongly discouraged in class*, with the following exceptions:

1. You have a documented disability for which taking notes on a computer is an accommodation. Please see the section on disability accommodations.
2. You have truly illegible handwriting. Please show me a sample of said handwriting by the end of Week 1.
3. You are aware of the downsides of computer use in the classroom but make an informed decision to do so anyway. To take advantage of this exception, please give me a one-page (typed or hand-written) write-up on the downsides of computer use in the classroom by the end of Week 1. The following articles can get you started.
   - “Students are Better Off without a Laptop in the Classroom” [https://www.scientificamerican.com/article/students-are-better-off-without-a-laptop-in-the-classroom/](https://www.scientificamerican.com/article/students-are-better-off-without-a-laptop-in-the-classroom/)