STAT 145, Biostatistics
Syllabus, Fall 2021

Material. The textbook for the course is **Statistics: Unlocking the Power of Data**, 1st Ed. (2013), by Robin H. Lock, Patti Frazer Lock, Kari Lock Morgan, Eric F. Lock, and Dennis F. Lock, a text I will generally refer to as **Lock5**. Specifically, we will cover

Chapter 1:	types of statistical studies and sampling
Chapter 2:	exploratory data analysis
Chapters 3–4:	statistical inference using bootstrapping/randomization distributions
Chapter 5:	the normal distribution model
Chapter 6:	inference for proportions/means using the normal model
Chapter 7:	chi-square tests
Chapter 8:	1-way ANOVA tests
Chapter 9:	inference for regression

We may delve into multiple regression (Chapter 10) if time allows for it.

Learning Outcomes. The student who successfully completes this course, will be able to

- explaion the basic concepts of experimental design and their role in addressing biological questions.
- choose appropriate graphical and numerical techniques to summarize univariate data and to describe the relationship betwee two variables.
- choose an appropriate statistical model to analyze data from several different standard experimental designs.
- construct and interpret confidence intervals and hypothesis tests for parameters of several statistical models.
- use a standard statistical software package (R) to carry out data analysis.
- state the underlying assumptions of the particular statistical models used in the course and explain the role that such assumptions play in these models generally.
- read journal articles that rely on statistical methods, to explain the methods used, and to evaluate the appropriateness of choice of methods.

Student achievement of the first six of these outcomes will be assessed via homework (to a lesser extent) and test questions (the greater portion).

Class Policies.

- **Come to class**, arriving and seatec on time, each day. If, for health reasons, you do not attend, contact a friend or the professor about material missed.

- **Turn off and put away cell phones**. Electronic devices, generally, should be stowed, unless specifically directed to use as a learning tool.
- **Read assigned passages**, usually taken from the textbook. It is preferable to do so before the session in which the material will be discussed. It is best to read with paper and pencil on-hand, testing out ideas as you go.
- **Participate full in class activities**.
- **Spend some of your discretionary time between class meetings on course material**. Do this without exception.
- **Review feedback on things you hand in**.
- **Keep a log of your scores** on homeworks and exams. This is handier than going into WebWork and Gradescope to learn what those scores are, though that is always available. If, at any time, you want to estimate your grade, calculate an approximate GPA for each grade category, and then use this app to calculate a weighted average.
- **Take ownership for discerning the relative importance of various concepts**. This is part of the discipline of becoming a good learner. Your professor will indicate concepts covered on an tests, but not how to apportion study time between those concepts.
- **Check for calendar updates, and your Calvin email regularly**. It is best to do this at least once in the evening each day.

Occasionally there are special circumstances that require class policies be adjusted for a particular student. In such cases, it is the responsibility of the student to inform me of the situation **as soon as possible**, so that appropriate arrangements can be made. This includes, but is not limited to, students with documented disabilities.

Accommodations. Calvin University has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Students with disabilities who may need some accommodation in order to participate fully in this class are urged to contact Disability Services in the Center for Student Success (`disabilityservices@calvin.edu`) as soon as possible to explore what arrangements need to be made to assure access. The three of us (student, instructor, and Disability Services) will work together to find an appropriate solution.

Grading. The various weights will be as follows:

- online homework and quizzes: 8%
- written homework: 12%
- Tests: 54%
- Final Exam: 26%

If, at any point in the course, you wish to estimate your grade, use this app to calculate your approximate grade as a weighted average according to the weights given above, leaving out those components that have not yet occurred.

Exams must be taken at the specified dates and times. Exceptions are negotiated in advance with the professor, and are limited to emergencies. Conveniently flights and other pre-arranged travel plans do not apply.

Cheating, which I define as any instance of using unauthorized sources, notes or devices (particularly relevant during tests); copying from another student or knowingly allowing a student to copy from your work, is unacceptable, and will, in the first instance, result in a zero. A second offense will result in dismissal from the course with a course grade of "F". Read more in Calvin's Student Conduct Code.

Exceptions. I reserve the right to make changes or exceptions to course policies, including those described in this document, either for the entire class or for individuals. The ultimate goal in this course is **learning**, and formal requirements should not unnecessarily stand in the way of that. Thus, if you think that any of the conditions of the course are interfering with learning, please speak with me about this, and we will consider what can be done.