

# STAT 110: Biostatistic Methods in Life Sciences

Zhe Fei

## Basics

- Lecture: M/W 08:00 AM - 09:20 AM
- Instructor: Zhe Fei, zhef@ucr.edu
- Location: Watkins 2240
- Instructor Office Hours: Th 10:00 AM - 12:00 PM via Zoom, <https://ucr.zoom.us/j/8631592699>
- TA: Evan Mason, emaso007@ucr.edu
- Lab: Mon/Wed 04:00 PM - 5:20 PM (Olmsted 1411)
- Discussion: Fri 10:00 AM - 10:50 AM (Dundee A1107 )
- TA Office Hours: Tu/Th 12:30pm - 2:00pm

## Description

5 Units, Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 011 or STAT 107; or equivalent. Provides undergraduate majors or those interested in life sciences with statistical tools for analyzing different types of data frequently encountered in life sciences. Emphasizes applications of methodology including contingency table analysis, linear regression and ANOVA, maximum likelihood method and the estimation-maximization algorithm, logistic regression, Poisson regression, and survival analysis.

## Textbook

- Regression Methods in Biostatistics (pdf link), by Eric Vittinghoff, et al.
- (Optional) Fundamentals of Biostatistics (7th edition) by Bernard Rosner

## Tips for Success

0. Consider the instructor and TAs as helpers of your learning. You are the center of the learning process.
1. View the course materials/notes/textbook before lectures, labs and discussions.
2. Be an active participant during lectures, labs and discussions.
3. Ask questions - during lectures, labs and discussions, in office hours, or by email. Ask me, your TAs, and your classmates.
4. Do the homework exercise - start early and make sure you attempt and understand all questions.
5. Give yourself plenty of time to prepare for exams. This requires going through the material and taking the time to review the concepts that you're not comfortable with.
6. **DO NOT PROCRASTINATE** - do not let any lectures go by with unanswered questions as it will just make the following lecture's material even more difficult to follow.

## Homeworks

Homework assignments will be assigned weekly (approximately).

The objective of the homework exercises is to help you develop a more in-depth understanding of the material and help you prepare for exams. Grading will be based on completeness as well as accuracy. In order to receive credit you must show all your work.

You are welcomed, and encouraged, to work with each other on the problems, but you must turn in your own work. If you copy someone else's work, both parties will receive a 0 for the homework grade as well as being reported to the Student Conduct & Academic Integrity Programs (SCAIP).

**Submission instructions:** You will turn in your homework **on Canvas**.

### Labs

The objective of the labs is to give you hands on experience with data analysis using modern statistical software. We will use R and RStudio, an integrated development environment for R, a programming language for statistical computing and graphics. R and RStudio are both free and widely used among statisticians and data scientists. You are welcomed to install them beforehand.

**Submission instructions:** Lab Assignments will be turned in **on Canvas by every Thursday 11pm**

### Grading

Item	Percentage
Homework	20%
Attendance	10%
Labs	20%
Midterm	25% (Week 5 Feb 7th Wednesday in class)
Final	25% (Mar 13th Wed, in class, OR Mar 20th Wed, 7 - 10 PM)

Grades may be curved at the end. Cumulative numerical averages of 90-100 are guaranteed at least an A-, 80-89 at least a B-, and 70 - 79 at least a C-. However the exact ranges for letter grades will be determined after the final exam.

### Work Load and Teamwork

You are expected to put in about 2 hours of work outside of class for each hour of lecture. Some of you will do well with less time, and some might need more. You are encouraged to study with your classmates. But remember that anything that is not explicitly a team assignment must be your own work. ### Policies

- You are responsible for checking announcements and accessing course materials on iLearn.
- Late work policy for the homework and labs reports:
  - next day: **lose 50%** of total possible points
  - later than next day: lose all points
- There will be no make-ups for homework, labs, quizzes, or exams. If the midterm exam must be missed, absence must be officially excused **in advance**, in which case the missing exam score will be imputed using the final exam score. This policy only applies to the midterm. All other missed assessments will receive a grade of 0. The final exam must be taken at the stated time. You must take the final exam to pass this course.
- Please be considerate of your classmates by arriving on time. If you arrive after at least one student has finished the exam and left the room, you will NOT be allowed to sit for the exam, and will receive a "0". Turn off cell phones before entering the exam room. If your cell phone rings during the exam, you will lose points on the exam.
- Use of disallowed materials (textbook, class notes, web references, any form of communication with classmates or other persons, etc.) during exams will not be tolerated. This will result in a 0 on the exam for all students involved, possible failure of the course, and will be reported to the Student Conduct & Academic Integrity Programs (SCAIP). If you have any questions about whether something is or is not allowed, ask me beforehand.

## Tentative Calendar and Topics

Week	Tentative Lecture Topics Schedule	References	Notes
1	Descriptive Methods	Ch2	
2	Estimation and Hypothesis Testing	Ch3	
3	Two Sample Test	Ch3	
4	ANOVA	Ch3	
5	Contingency Table Analysis	Ch3	Midterm
6	Regression and Correlation	Ch4	
7	Linear Regression	Ch4	
8	Logistic Regression	Ch5	
9	Survival Analysis	Ch6	
10	Repeated Measures and Longitudinal Data	Ch7	Final