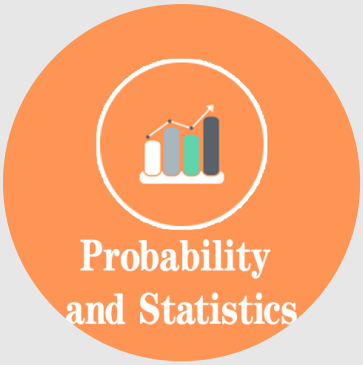

Introduction to Statistical Modeling

STAT 011

Instructor Info

Ruihan Lu

Office Hrs: Mon & Wed 9:30-11:00 am or by appointment

Zoom

https://ucr.zoom.us/j/98495869897

rlu014@ucr.edu

Course Info

STAT 008 with a grade of C- or better or STAT 010 with a grade of C- or better

Monday & Wednesday & Friday

8-8:50 am

Winston Chung Hall 138

Lab Info

Lab 021/022/023

80 mins Per Section

OLMH 1411

TA Info

Check Announcement

Overview

This class is an introduction to inferential statistics. Topics include hypothesis testing and power calculation, analysis of variance, linear regression, logistic regression, and nonparametric tests.

Material

Required Texts

Diez, Barr, Cetinkaya-Rundel. *OpenIntro Statistics*. 4th Edition. 2019.

Other

All lecture slides and notes will be provided on Canvas.

Grading Scheme

5%	Attendance/Participation
10%	Quiz
15%	Homework
15%	Lab Worksheets
25%	Two Midterm Exams
30%	Final Exam (Cumulative)
6%	Bonus Points

Grades may be curved at the end of the quarter, and curving is at the professor's discretion. Cumulative numerical averages of 90-100 are guaranteed 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. The more evidence that the class has mastered the material, the more generous the curve will be.

Note: To ensure fairness to all students, emails received at the end of the quarter asking for your grade to be 'bumped up' / 'boosted' / 'raised' / etc. will not be considered or answered.

Tips for Success

- Consider the instructor and TAs as helpers in your learning. You are the center of the whole learning process.
- View the course material/textbook/videos before lectures, labs, and discussions.
- Be an active participant during lectures, labs, and discussions.
- Ask questions - during lectures, labs, and discussions, during office hours, or via Email. Ask me, your TAs, and your classmates.
- Do the homework exercise - start early and make sure you attempt and understand all questions.
- Give yourself plenty of time time to prepare for exams. This requires reviewing the material and taking the time to review the concepts you're uncomfortable with.
- DO NOT PROCRASTINATE - don't let a unit go by with unanswered questions, as it will make the following unit's material even more difficult to follow.
- Continuously check your grades for HW, Attendance, Labs, Quizzes, and Midterm on Canvas. Once a grade has been posted, you have one week to let us know if you have any questions.

LAB

Do we need Laptop/Computer in the class?

Not required. This class will give you hands-on experience with data analysis using modern statistical software in a computer room. So you are given a computer during your lab section. And you are always welcome to make an appointment to use the computer room outside of class time.

Which Software are we using?

We will use a statistical analysis package called RStudio, a front end for the R statistical language. R and RStudio are free and widely used among statisticians and data scientists. You need to install them on your laptop for finishing lab work and play with them when necessary.

Installation

The details about installing RStudio to your laptop are provided by this link: `https://cloud.r-project.org/`

Submission or Worksheet

There will be a total of 10 lab assignments. During your lab session, you will receive two files. One is an HTML document with instructions about how to use RStudio and how to complete lab assignments. Another one is an empty RmarkDown file you can use as a template. You can directly put your answers in a word document OR code your answers into the Answer sheet. No late lab answers will be credited.

Attendance

Attendance will be recorded randomly during the lecture. No makeup for attendance. However, I understand that life happens; many of you juggle various responsibilities such as work and family obligations in addition to being a student. Thus, I will grant one excused absence or late (not for the midterms or final exam), no explanations necessary. If you are using your one excused absence, please email me clearly stating, 'I will be using my one excused absence for the class meeting of [insert date here].'

Quizzes

On even's week, there will be a quiz during the discussion section. Quizzes are open books/notes. These quizzes cannot be made up, and no credits once the deadline has passed.

Homework

There is a total of 7 homework that are assigned (approximately) bi-weekly. 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. Homework problems are all coming from our textbook.

Submission Instruction: You will finish your HW and submit it on Canvas. No late homework will be credited.

Exams

There will be three exams - two midterms and a Final exam on June 12, 8 to 11 a.m. I'll discuss how exams will look and review the materials before the exam. These exams will be open notes. No make-up exams will be given unless extenuating circumstances exist. The instructor must be notified within 24 hours of the scheduled exam time, or a score of 0 will be recorded. No sharing of books, notes, tables, etc., will be allowed during exams! Any exchange of information during exams will result in a score of 0 for all involved persons and possible course failure and will be reported to the Student Conduct and Academic Integrity Programs. Failure to attend these exams will directly fail this course.

Diversity and Inclusively Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability - and other visible and non-visible differences. All class members are expected to contribute to a respectful, welcoming, and inclusive environment for every other class member.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact Student Disability Resource Center at 951-827-3861 or email sdrc@ucr.edu, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter.

Academic Integrity

The University Code of Academic Integrity is central to the ideals of this course. Violations of the Code are most serious and will be handled in a manner that fully represents the extent of the Code, and that befits the seriousness of its violation.

Tentative Class Schedule and Topics

WEEK	TOPICS	REFERENCE	
Week 1	Normal Distribution, Central Limit Theorem	Ch 4.1, 5.1	
Week 2	Chi-square test, t-test	Ch 6.3, 7.1	
Week 3	Paired t-test, Two-sample t-test	Ch 7.2, 7.3	
Week 4	Power, Sample Size Calculation	Ch. 7.4	Midterm 1, Apr 24
Week 5	One-way ANOVA, Two-way ANOVA	Ch 7.5	
Week 6	Simple Linear Regression	Ch 8.1, 8.2	
Week 7	Inference of Linear Regression	Ch 8.3, 8.4	Midterm 2, May 19
Week 8	Multiple Regression	Ch 9.1, 9.2, 9.3	
Week 9	Logistic Regression	Ch 9.5	
Week 10	Nonparametric Tests		

Lab Schedule

Week 1	Introduction to R & RStudio	Students will get familiar with the interface of Rstudio and be able to use RStudio to do mathematical operations.
Week 2	Introduction to Data	Students will be familiar with data types and be able to input different types of data into RStudio.
Week 3	Normal Distribution	Students will be able to use R to generate random variable from a Normal distribution and calculate the probabilities and percentiles in a Normal distribution.
Week 4	Sampling Distribution	Students will be able to use R to visualize and describe the sampling distribution.
Week 5	Confidence Interval	Students will be able to use R to find critical values and calculate confidence intervals.
Week 6	T-test	Students will be able to use R to construct a formal t-test and finish a comprehensive hypothesis testing questions.
Week 7	ANOVA	Students will be able to use R to compare multiple means and construct a post-hoc comparison.
Week 8	Linear Regression	Students will be able to use R to calculate the linear relationship between two variables and then build a simple linear model in R. Last, students will able to do model diagnostics in R.
Week 9	Simulations	Students will be able to use R to conduct a simulation study .
Week 10	Mini Project	Students will be able to complete a formal data analysis procedure on their own.

WELCOME TO THE CLASS!!

The syllabus is a general plan. The instructor reserves the right to make and announce modifications to the class.