STA 106 Analysis of Vairance

Winter Quarter 2022

Instructor:	Xiner Zhou	**Time:**	MWF 3:10 PM - 4:00 PM
Email:	xezhou@ucdavis.edu	**Location:**	Wellman Hall 234

Course Objectives:

- Learn basic principles in scientific study designs
- Understand underlying statistical principles and methods for analyzing data arising from scientific studies
- Develop skills (from theory to application) to build ANOVA models in various applications.

Teaching Assistants and Discussion Sessions:

Yejiong Zhu
Email: yjzhu@ucdavis.edu

B01 ..... Hart Hall 1130 ..... Thursdays 4:10 PM - 5:00 PM
B02 ..... Wellman Hall 1 ..... Thursdays 5:10 PM - 6:00 PM

Course Pages:

- Canvas: All the course material will be posted on canvas
- Discord
  - You're encouraged to use discord as the primary platform for communication among students, the TA and the instructor.
  - Please use the following link to join the class server https://discord.gg/xSNnWnUxaU
  - You can use specific channels or general channel to discuss any questions related or not-related to the course.
  - If you have private messages for TAs and the instructor, you can start private conversations.
  - TAs and the instructor will likely not respond immediately as they have their own work to do, but the expectation is to reply within 24-hour.

Office Hours: Start from week 2, zoom link will be set under zoom section on canvas. Open to suggestions if these time do not work for many.

Xiner ..... online ..... Mondays 7 - 8PM
Yejiong ..... online ..... Fridays 7 - 8PM

References: No textbook is required, only recommend. Related chapters will be posted on canvas for use limited to this class.

- Kutner, M.H., C.J. Nachtsheim, J. Neter and W. Li (2005). Applied Linear Statistical Models, 5th ed. McGraw-Hill, New York.

Prerequisites: STA 013 or STA 032 or STA 100

Course Outline:

- Lecture 1: Introduction to the Design of Experimental and Observational Studies
- Lecture 2: Single-Factor Studies
- Lecture 3: ANOVA Diagnostics and Remedial Measures
- Lecture 4: Two-Factor Studies with Equal Sample Sizes
- Lecture 5: Two-Factor Studies with One Case per Treatment
- Lecture 6: Linear Regression Approach to ANOVA Regression

Software: R (http://www.r-project.org/) and RStudio (https://www.rstudio.com/products/rstudio/download/#download) Install R and RStudio before the first discussion session on Thursday, Jan 6th.

Grading Policy:

- Homework assignments (30%)
- Midterm (30%):
  - In class
  - Monday on the 6th week of winter quarter, February 7th 2022
- Final (40%):
  - cumulative
  - March, 18 2022 3:30 PM

The final letter grade (A/B/C/D...) will be curved and based on relative positions among all students. Please ignore whatever letter grade canvas shows you.

Homework assignments:

- There will be 7 assignments corresponding to roughly 7 lecture topics, the due date will be set a few days after finishing each topic.
- Homework assignments may include concept explanation, data analysis with R, interpretation of analysis results, and rigorous derivations.

- Discussion sessions will be devoted heavily to help with homework problems
- you can study in groups and discuss problems with others, but you should write up the solution independently. If you discuss homework problems with others or use other's code, always clearly acknowledge their name(s) in your reports. Failing to given proper acknowledgment will be counted as **plagiarism**.
- homework solutions should be submitted electronically on Canvas by the deadline. No late submission will be accepted.
- The submission should include an HTML file and the RMD file to reproduce it, or separate files such as a scanned file for non-coding related questions if you prefer hand writting in paper.
- The lowest grade will be dropped, so your highest 6 homework grades will account for 30% of final grade.

Midterm and Final Exam:

- In-person exams (tentative, subject to public health policy)
    - 1 double-sided cheat sheet is allowed
    - calculator will be needed

Academic integrity policy:

Academic misconduct includes copying from, or referencing without proper acknowledgment, external sources or your peers, etc. Students must abide by the UC Davis Code of Academic Conduct. All teaching faculty at UC Davis are instructed to report all suspected cases of cheating and other misconduct to the Office of Student Support and Judicial Affairs Office of Student Support and Judicial Affairs, whether the student admits to it or not. Furthermore, "If academic misconduct is admitted or is determined by adjudication to have occurred, instructors may assign a grade penalty no greater than " F " for the course in question. If a report is pending at the end of an academic term, instructors should assign a temporary grade of " Y " for the course until the report is resolved."

Classroom policy:

Student behavior should fit the UC Davis policy on student conduct and discipline. Please respect your fellow students, teaching assistant, and the instructor in lectures, discussion sessions, office hours, and on the discussion board. Please refrain from any other activity that disrupts the course of the lecture. Derogatory or inflammatory comments about other individuals, cultures, groups, or viewpoints are not tolerated. As per UC Davis policy, instructors and teaching assistants may direct a student to leave a class immediately if the student's behavior is disruptive.

Academic (and legal) misconduct: Course materials:

Lectures and course materials, including presentations, tests, outlines, and similar materials, are protected by U.S. copyright law and by University policy. The instructor is the exclusive owner of the copyright in those materials. You may take notes and make copies of course materials for your own use. You may also share those materials with another student who is enrolled in this course.