STAT 3200
Applied Linear Regression
MWF 10:30am–11:20am,
Spring 2025, 110 MLH

Instructor

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DEO

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Graders

Dongwei Zhang, dongwei-zhang@uiowa.edu

Grader should be contacted about issues with homework grades.

Prerequisites

STAT 2020 (Probability & Statistics for Engineering and Physical Sciences); or STAT 2010 (Statistical Methods and Computing); or STAT 3120 (Probability and Statistics for Data Science).

Students ought to have some fundamental statistical training as taught in the classes mentioned above. In particular, a basic understanding of probability, random variables, discrete and continuous distributions, one- and two-sample hypothesis tests, confidence intervals, point estimation, and correlation is expected.

Textbook

Linear Models with R by Julian J. Faraway, 2nd edition (ISBN: 1439887332).

Software

We will use the **R** language for our analyses in this class. **R** is open-source statistical software and very useful for analyses involving linear models. It is available for free at: https://www.r-project.org/. **RStudio** is a nice *integrated development environment* for **R** (https://posit.co/download/rstudio-desktop/), which will likely make your experience with **R** (and doing the homework) much easier.

Other software:

- **RMarkdown:** https://rmarkdown.rstudio.com/lesson-1.html
- **Tidyverse:** https://r4ds.had.co.nz/

Learning Objectives

We will cover most of the material from the textbook along with a treatment of logistic regression. The following topics will be covered:

- Simple and multiple linear regression
- Linear model formulation, checking, and selection
- Linear model estimation, explanation, and inference
- Missing data, transformations and categorical predictors (e.g. ANOVA)
- Simple and multiple logistic regression
- Interpretation and presentation of linear & logistic regression analysis
- **R** for linear and logistic regression
- Producing data analysis/visualization reports using **R** and **RMarkdown**

Course Website

https://uiowa.instructure.com/courses/244362

Lecture notes, Rmarkdown notebooks, homework assignments and solutions, review materials, grades, etc...

Office Hours

Office hours are a great time and place to discuss any questions that you have about have about the homework, exams, or other questions about the course. I encourage *everyone* to stop by at some point in the semester! Office hours will be held at the following times in my office 205 SH (unless there is an official university holiday):

Monday: 1pm–2pm
Wednesday: 2pm–3pm
Thursday: 10am–11am

Grading

Homework	25%	Approximately 6–8 homeworks will be assigned.
Midterms	40%	Two in-class midterm exams of 20% weight each
Final	35%	

Exams will be curved as necessary. Final grades will be awarded based on the following ranges:

A		**B**		**C**		**D**	
A+	>97%	B+	>87%	C+	>77%	D+	>67%
A	>93.5%	B	>83.5%	C	>73.5%	D	>63.5%
A-	>90.5%	B-	>80.5%	C-	>70.5%	D-	>60.5%

Any final grade achieving less than 60.5% (inclusive) will be awarded an F.

Homework

Homework will be (mostly) be assigned periodically and due about 1 to 2 weeks after they are assigned. Homework will be accepted late if turned in the next class period (e.g. on Monday if due on Friday) with a 25% penalty. After that, it will only be possible to achieve a maximum of 50% on the homework. **The lowest homework score will be dropped**.

Homework will consist of data analysis projects. Code output and data visualizations, along with interspersed text, will be expected. The easiest way to

construct homeworks will be to use **RMarkdown** to produce a word document or pdf. However, use of **RMarkdown** is not required and either a word document or a pdf file will be accepted. Homeworks will be submitted online on ICON.

Exams

There will be two in-class midterms, scheduled on the following dates:

- March 7th
- April 11th

A single two-sided, 8.5" x 11" cheat sheet (handwritten) will be allowed for all exams.

The final exam will be comprehensive and, in principle, cover all of the information that we learned over the course of the semester.

If you have an appropriate, documented reason why you must miss a midterm, please reach out and provide me with such documentation and reason for your absence so that you may take it at a different time. Students who miss a midterm without an appropriate, documented reason will receive a 0 on said midterm.

Attendances, Class Participation, and Absences

Attendance is not necessary, and I plan on uploading lecture notes online. However, I should say that you will be much more well-equipped to succeed if you attend class! Students are encouraged to ask questions and come to office hours, as well as discuss homework problems with other students. Active participation in lecture is also encouraged. If there is something you don't understand, let me know—there's bound to be someone else who feels the same way.

University regulations require that students be allowed to make up examinations that have been missed due to *illness, religious holy days, military service obligations (including service-related medical appointments), or other unavoidable circumstances or University-sponsored activities*. Students with UI-authorized activities must discuss their absences with the instructor as soon as possible. Religious obligations must be communicated within the first three weeks of classes. Students are requested to use the **absence form** in ICON under Student Tools.

Academic Honesty and Misconduct

All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty. If you have any doubts about what constitutes a violation of the CLAS Code of Academic Honesty, or any other issue related to academic integrity, please contact me.

Undergraduate academic misconduct must be reported by instructors to CLAS according to these procedures. Graduate academic misconduct must be reported to the Graduate College according to Section F of the Graduate College Manual.

Student Complaints

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor (me) and finally with the DEO (Chair) of the department, school or program offering the course. Sometimes students will be referred to the department or program's Director of Undergraduate Studies (DUS) or Director of Graduate Studies (DGS).

Undergraduate students should contact CLAS Undergraduate Programs for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS Dean's Office when additional support is needed.

Drop Deadline for this Course

You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a "W" will appear on your transcript. The mark of "W" is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the Registrar's website. Graduate students should adhere to the academic deadlines and policies set by the Graduate College.

Date and Time of the Final Exam

The final examination date and time will be announced by the Registrar generally

by the fifth week of classes and it will be announced on the course ICON site once it is known. **Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.** According to Registrar's final exam policy, students **have a maximum of two weeks after the announced final exam schedule** to request a change if an exam conflict exists or if a student has more than two exams in one day (see the policy here).

Communication: UI Email

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community. For the privacy and the protection of student records, UI faculty and staff can only correspond with UI email addresses.

Mental Health Resources and Student Support

Students are encouraged to be mindful of their mental health and seek help as a preventive measure or if feeling overwhelmed and/or struggling to meet course expectations. Students are encouraged to talk to their instructor for assistance with course-related concerns. For additional mental health support, please see the guidance and resources at mentalhealth.uiowa.edu, including the 24-7 UI Support and Crisis Line.

Additionally, the Office of the Dean of Students can help students navigate personal crisis situations. They can provide one-on-one support, help with identifying options, and access to basic needs resources (such as food, rent, childcare, etc.). Student Care and Assistance: 132 IMU, dos-assistance@uiowa.edu, or 319-335-1162 and more info: dos.uiowa.edu/assistance

Accommodations for Students with Disabilities

The University is committed to providing an educational experience that is accessible to all students. If a student has a diagnosed disability or other disabling condition that may impact the student's ability to complete the course requirements as stated in the syllabus, the student may seek accommodations

through Student Disability Services (SDS). SDS is responsible for making Letters of Accommodation (LOA) available to the student. **The student must provide an LOA to the instructor as early in the semester as possible, but requests not made at least two weeks prior to the scheduled activity for which an accommodation is sought may not be accommodated.** The LOA will specify what reasonable course accommodations the student is eligible for and those the instructor should provide.

ChatGPT and AI Policy

Use of AI for the completion of assignments is *discouraged* but not strictly prohibited. Where AI-content generators such as ChatGPT are used, I expect there to be attribution made to said content. For example, even a brief sentence that some code was generated by ChatGPT and modified by the student can suffice. Without proper attribution, this constitutes academic dishonesty. If you are unsure about whether or not the use of an AI tool may constitute academic dishonesty, you are welcome to contact me, though my advice is to simply not use it.

Additional Links

Free Speech and Expression
Absences for Religious Holy Days
Classroom Expectations
Non-discrimination
Sexual Harassment/Misconduct and Supportive Measures