

**STATS 191**  
**Introduction to Applied Statistics**  
**Summer 2025**

**INSTRUCTOR:** Maddie Schroth

**EMAIL:** mschroth@calpoly.edu

**OFFICE HOURS: TBD**

**LECTURE:** MWF 1:30pm-2:45pm

**MATERIALS:**

- **Textbook:**
  - Applied Linear Regression Models (Kutner et. al, 4th edition)
  - The textbook is optional but recommended. The textbook will serve as a guide, but I expect to supplement the material in the textbook extensively.
- **Handouts:**
  - The most important learning materials for this class will be the course notes that we will work through in each class session. I will typically post these on Canvas at least two days prior to the day we will need them. I strongly encourage you to print out the notes and fill them in by-hand during class. You may access the notes electronically if you prefer, though a tablet + pen is recommended in this case.
- **Computer/Internet access:**
  - I will send email on a regular basis and plan to make use of the *Canvas* site to post handouts, homework, quizzes, etc. It is your responsibility to keep current with updates to the course Canvas site and check on a weekly basis that the posted grades are correct.
- **Statistics Software: NEED TO UPDATE THIS!!!**
  - We will predominantly be using R/RStudio for data analysis and exploration (download instructions can be found [here](#)). You will be given instructions for how to use R/RStudio as needed for this course.

## **COURSE DESCRIPTION:**

From predicting the length of hospital stay of a surgical patient to determining what aspects of a house are most strongly tied to its price, regression drives decisions that affect nearly every aspect of our lives. In this class you will not only learn to use regression analysis methodology to discover important relationships between variables and make predictions, but you'll discover just how relevant regression is to your own lives.

STATS 191 will expose you to linear statistical models and show you real-world applications. The focus will be on selecting the appropriate model, assessing the fit of the model, and effectively communicating statistical results. Computer technology will be used to facilitate data analysis and explore concepts.

Topics include data analysis using linear regression models; model equations in algebraic form, inference and prediction, interpretation of results, model assumptions and diagnostics, data transformations, model selection and validation, model building using categorical predictors, interactions, polynomials; and logistic regression models for binary data.

## **COURSE LEARNING OUTCOMES:**

*Upon completion of this course, students will be able to:*

- Analyze data using the linear regression model and correctly interpret the results.
- Apply transformations to data and interpret the results.
- Use polynomials, categorical variables, and interactions to model relationships in data and interpret the results
- Compare different models (including those with transformations, categorical predictors, interactions, and polynomials) and select the best model to describe the data.
- Create a report to describe the results of a linear model to a non-statistician.
- Assess the validity of model results.
- Analyze data using the logistic regression model and correctly interpret the results.

## **CLASS FORMAT AND CULTURE:**

It will be important for you to come to class, to participate fully, to ask questions, and to be responsible for all course handouts. This will allow us to focus more on the interpretation and presentation of statistical analyses. I hope to create a collaborative learning environment, where you feel comfortable asking questions and working together. Still, I do ask that when I am lecturing that you give me your complete and undivided attention and that you are respectful of me and your classmates. This includes keeping your cell phones put away during class.

## **ASSESSMENT:**

Weekly Submissions	15%
Assignments	25%
Exam 1	25%
Final	35%

Tentative letter grade ranges: 90%-100% = A/A-, 80%-90% = B+/B/B-, 70%-80% = C+/C/C-, 60%-70% = D+/D/D-. These ranges are very approximate and subject to change (but only favorably).

## **WEEKLY SUBMISSIONS:**

Every week we will complete several handouts/activities during class time. Most of the time you will complete them with a partner and/or we will work on it together. I will ask you to upload your answers to most of the handouts to Canvas by Saturday @ midnight.

There may also be a few quizzes/labs to be completed in-class. I will let you know as the course develops.

## **ASSIGNMENTS:**

Homework assignments will be posted on Canvas and will be due on Canvas at the indicated date and time. Homework assignments must be typed in a word processor (or

RMarkdown) and submitted on Canvas as a PDF (or HTML file if using RMarkdown). You will be expected to utilize the computer for much of your analysis on homework and must *include* all relevant output with your assignment for full credit. Further instructions will be provided in each assignment.

**Working together** on homework assignments is permitted and strongly encouraged. If you work in groups on the homework, make sure that the name of all the students are at the top of the homework and make sure that **ONLY ONE** student submits the homework!

The main requirement for all homework problems is that you **EXPLAIN** your answers. Often, questions may have more than one correct answer so several answers will be accepted as long as they are **JUSTIFIED**. You should also state any **ASSUMPTIONS** that you make. Soon you will be explaining your results to managers and people outside your discipline, so you need to get used to explaining and backing up the numbers! You'll also be given partial credit for your work, so it is important to at least attempt each problem.

Submission Information:

- My plan is to make homework due **Wednesdays by midnight**, but make sure you work on them as soon as they are available so that you have time to ask questions.
- If your assignment is late (submitted after 11:59pm), you will have grade deductions of **30% for every additional day.**
- No extensions will be given on any assignments for any reason.
- An assignment is considered late, even if it is 1 second after the due date.
- PLEASE DO NOT send emails to the professor asking for extensions.
- If you forgot to submit an assignment, make sure you submit it ASAP. There is no need to email the professor. Once you submit it, your assignment will be tagged as "LATE" and the grade deduction will be automatically applied. **BUT at the end of the quarter, the professor will give you a chance to remove the "late" tag from 2 assignments. :)** Please see more information below.

## **EXAMS:**

I will provide you with more detailed information about each exam as they approach. But know that you will be required to work completely independently on all exams. The tentative time for the exams are provided below.

- Midterm: Friday July 18

- Final: Friday August 15
- No make-up exams will be given. If you miss the midterm due to illness or emergency and you have a doctor's note/proof of emergency, I will use your Final Exam grade as the grade for the midterm.
- Final Exam will be cumulative.
- You can use notes on your exams according to the guidelines below:
  - **Midterm:** one full page (one-sided) (i.e the entire front side of a page)
  - **Final Exam:** 1 page (2-sided) (i.e. one page both front and back).
  - The idea is for you to continue adding to your notes as the course progresses.
  - Please use paper that is no bigger than 8.5x11 inches.

#### **OWNERSHIP OF COURSE MATERIALS:**

The course materials provided to you online and in class are yours for your personal use for the quarter and to keep as a reference for your career. I expressly do not give permission for you to sell or freely distribute my course materials, including exams, quizzes, labs, homework assignments, or solutions.

#### **LATE/MISSED WORK POLICY**

It is essential that you meet assignment deadlines in order to keep up with the pace of the course and have plenty of time to ask questions should the need arise. As the Instructor I will provide plenty of lead time before an assignment is due, but it is your responsibility to check Canvas regularly and to complete assignments on time.

The official time for submission of assignments is 11:59pm. If your assignment is late (submitted after 11:59pm), you will have grade deductions of **30% for every additional day.**

**IMPORTANT:** In an effort to create a fair, equitable learning context for all students, I will follow these guidelines for **all students:**

- You will be allowed to upload assignments after the due date, but late assignments will have grade deductions of **30% for every day.**

- An assignment is considered late, even if it is 1 second after the due date.
- All assignments must be submitted to Canvas by their respective due dates.
  - Please DO NOT send assignments to my email, I will not respond to those emails and the assignment will NOT receive credit.
  - Please DO NOT attach assignments to comments in Canvas, I will not respond to those comments and the assignment will NOT receive credit.
- No extensions will be given on any assignments for any reason, so please DO NOT send emails to the instructor asking for extensions.
  - **BUT at the end of the quarter, I will drop your lowest Weekly Submission and your lowest Homework Assignment**

Also, please be careful when uploading assignments to Canvas!

- Every time you upload an assignment please make sure that you are uploading the correct file
- Every time you upload an assignment please make sure that the upload was complete

### **COMMUNICATION POLICY:**

It is your responsibility to keep current with updates to the course website and check on a weekly basis that the posted grades are correct. I will occasionally use e-mail to send out exam reminders, modify homework assignments, and make other announcements. You are responsible for all information communicated by e-mail.

You are encouraged to ask questions during class and out of class. Besides office hours, the next best way to contact me is with our class Discord (here). This way, everyone can see the answers to any questions posed. Please only email me with personal questions. If you have any content related questions, post them to the class Discord site.

If you need to contact me privately or discuss your grade, please send me an email at mschroth@calpoly.edu. When emailing, please include your name, class, section, and topic. I will typically reply to each email/post within 24 hours. If you do not hear from me within 24 hours it is possible that I never received your email, so consider resending it.

Each week I will be holding office hours. If you have questions about the course material, please stop by to get the help you need -- no question is too small.

### **DIVERSITY, EQUITY, AND INCLUSION**

I strive to make this classroom a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, races, ethnicities, social classes, genders, gender identities, gender expressions, national origins, documentation statuses, religious affiliations, sexual orientations, abilities – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful and inclusive environment for every other member of the class. This does not mean we cannot disagree or have different ideas. It does mean we try to consider perspectives other than our own, though they may differ from our beliefs and experiences. In this course, I ask all students to be mindful of their comments and to be aware that although they may not intend to hurt others, some comments have a harmful impact.

### **ACADEMIC INTEGRITY: ASK DENNIS/SUSIE ABOUT THIS**

Any act of academic dishonesty, such as cheating, plagiarism, or unauthorized collaboration is subject to University disciplinary action and can result in failing the course. Please thoroughly familiarize yourself with the [Office of Students' Rights and Responsibilities page](#) on Academic Integrity, as well as the information found on [Academic Programs and Planning website](#) regarding cheating and plagiarism.

### **DISABILITY RESOURCE CENTER: ASK DENNIS/SUSIE ABOUT THIS**

It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the [Disability Resource Center](#), Building 124, Room 119, at (805) 756-1395, as early as possible in the term.

### **COVID-19 COMPLIANCE:**

Your presence in class is your attestation that you are following the University's current COVID-19 safety protocols including monitoring your health and staying home if you are feeling unwell.

### **USE OF ARTIFICIAL INTELLIGENCE TOOLS**

Unless expressly given permission, the use AI Writing tools including ChatGPT are not permitted for any stage or phase of work in this class.

### **DISCLAIMER:**

All of these details are subject to change as the course develops. I welcome and value your input.