

STAT 610 – Linear Regression Models**Fall 2021****Class time:** MW 4:00-5:15PM**Location:** E-427**Instructor:** K. Hasenstab (Prof H)**Email:** kahasenstab@sdsu.edu**Web:** kahasenstab.sdsu.edu**Office Hours:** MW 5:30-6:30PM
(or by appointment)**Office Room:** GMCS-522**Course Information**

Course Description: STAT610 primarily covers linear regression analysis (simple and multiple) from an applied point of view. This includes inference (estimation, confidence intervals, hypothesis testing, prediction and inverse prediction) for simple and multiple linear regression, model checking and residual analysis, and model building/variable selection. A matrix formulation of the regression model will also be presented. Additional topics will be introduced as time permits. Note the emphasis of this course is on “applications”, meaning understanding and selecting models, performing data analysis, interpreting regression coefficients, and understanding computational aspects of regression. R will be used extensively (no prior R experience assumed).

Student Learning Outcomes:

By the end of this course, students will be able to

- Construct point estimators of the model parameters and understand their statistical properties
- Construct interval estimators (confidence intervals) for the parameters of interest
- Conduct hypothesis tests for the parameters of interest
- Assess and test the assumptions of the statistical model
- Build statistical models (i.e. determine which model variables are important and which ones can be dropped from the model)

Prerequisite: Statistics 551B with a grade of C or better.

Required Text: *Applied Linear Regression Models*. By Kutner, Nachtsheim, and Neter, 2004, 4th edition. ISBN: 978-0-07-301344-2

Canvas LMS: This course will be managed using the Canvas Learning Management System. For additional resources and tutorials on how to use Canvas, please visit this [website](#).

Statistical Software: We will be using [R](#) to apply the concepts learned in this course. R is an open-source programming language for statistical computing and is the third most popular language among data scientists (behind Python and SQL). There are several graphical user interfaces for interacting with the R programming language. We will use R through [Google Colaboratory](#) and [RStudio](#). Instructions for these free installations will be made available on Canvas.

Important Dates: Drop with no record and full refund 09/03/2020
 Withdraw with partial refund 10/30/2020
Additional information and important dates can be found at [here](#).

Lectures and Office Hours

Lectures: The course will consist of two weekly in-person class lectures ~75 minutes each. Availability of lecture recordings are to be determined.

Students should bring laptops to class. There will be group coding activities throughout the semester designed to provide you with additional experience applying the methods covered in lecture.

Office Hours: In-person office hours are held weekly and will be conducted as a public forum for questions pertaining to the course. If your office hours visit is of a sensitive nature or if you are unable to attend office hours at the regularly scheduled time, you may request an appointment in-person or by Zoom. I'm here to help!

Assignments, Examinations, and Grading

Homework: Homework assignments will be assigned weekly and are due one week following the date posted. Assignments will be graded for completeness, correctness, and work shown. Homework assignments must be submitted in **.pdf** or **.ipynb** format and typed (not handwritten). This includes mathematical notation using either LaTeX or an equation editor within your word processor. *Students must show work and include code to receive full credit.*

Although I encourage working with other students to complete homework, **students must individually submit their own assignments on Canvas**. Please do not simply copy each others' answers as this is a form of academic dishonesty. In these cases, students will be disciplined accordingly (see below).

Midterm Examinations: Two midterm examinations, each worth 20% of the total grade, will be administered on Canvas throughout the semester.

Final Examination: The final examination will cover material from the entire course and will be worth 20% of the total grade. The final will also be administered on Canvas.

Project: Students are required to complete a course project, which will be due near the end of the semester. The purpose of the project is to provide you with experience applying fundamental concepts learned throughout the course to a real-world application. The dataset will be provided for you. Details on the project and project grading rubric will be announced during the semester.

Tentative Grading Breakdown:

The following grading scale will be used to determine letter grades: A = 90 – 100% B = 80 – 89.9% C = 70 – 79.9% D = 60 – 69.9% F = below 60%. Grades will be based upon the following components.

Homework	20%
Midterm 1	20%
Midterm 2	20%
Final Examination	20%
Project	20%

Class Policies

Attendance: Although not required, attendance is strongly encouraged. Students will be given the opportunity to ask questions, participate in polling, and engage with other students throughout the course.

Make-up Policy: Exams are to be taken at the time and date scheduled. Make-up exams will be given only for legitimate, documented reasons (e.g., illness). Under no circumstances will make-ups be given to accommodate travel arrangements that conflict with scheduled course activities.

Respect your peers! Please conduct yourselves in a respectful manner towards the other students, and towards the instructor, both in lecture and the discussion forums. Disrespectful language or disruptive behavior can result in the temporary or permanent removal of the student from the class. Additionally, please mute yourselves during lecture to avoid disrupting class. And dress appropriately for Zoom!

University Policies

Academic Accommodations: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Ability Success Center at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Ability Success Center as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Ability Success Center. Your cooperation is appreciated. Contact information can be found [here](#).

Student Privacy and Intellectual Property: The [Family Educational Rights and Privacy Act](#) (FERPA) mandates the protection of student information, including contact information, grades, and graded assignments. I will use Canvas to communicate with you, and I will not post grades or leave graded assignments in public places. Students will be notified at the time of an assignment if copies of student work will be retained beyond the end of the semester or used as examples for future students or the wider public. Students maintain intellectual property rights to work products they create as part of this course unless they are formally notified otherwise.

Religious observances: According to the University Policy File, students should notify the instructors of affected courses of planned absences for religious observances by the end of the second week of classes.

Academic Honesty: The University adheres to a strict [policy prohibiting cheating and plagiarism](#). Examples of academic dishonesty include but are not limited to:

- copying, in part or in whole, from another's test or other examination;
- obtaining copies of a test, an examination, or other course material without the permission of the instructor;
- collaborating with another or others in work to be presented without the permission of the instructor;
- falsifying records, laboratory work, or other course data;
- submitting work previously presented in another course, if contrary to the rules of the course;
- altering or interfering with grading procedures;
- assisting another student in any of the above;
- using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work);
- copying and pasting work from an online or offline source directly and calling it your own;
- using information you find from an online or offline source without giving the author credit;
- replacing words or phrases from another source and inserting your own words or phrases.

The California State University system requires instructors to report all instances of academic misconduct to the Center for Student Rights and Responsibilities. Academic dishonesty will result in disciplinary review by the University and may lead to probation, suspension, or expulsion.

Instructors may also, at their discretion, penalize student grades on any assignment or assessment discovered to have been produced in an academically dishonest manner.

Medical-related absences: Students are instructed to contact their professor/instructor/coach in the event they need to miss class, etc. due to an illness, injury or emergency. All decisions about the impact of an absence, as well as any arrangements for making up work, rest with the instructors. [Student Health Services](#) (SHS) does not provide medical excuses for short-term absences due to illness or injury. When a medical-related absence persists beyond five days, SHS will work with students to provide appropriate documentation. When a student is hospitalized or has a serious, ongoing illness or injury, SHS will, at the student's request and with the student's consent, communicate with the student's instructors via the Vice President for Student Affairs and may communicate with the student's Assistant Dean and/or the [Student Ability Success Center](#).

Sexual violence / Title IX mandated reporting: As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I am a mandated reporter in my role as an SDSU employee. It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep the information you share private to the greatest extent possible. However, I am required to share information regarding sexual violence on SDSU's campus with the Title IX coordinator, Jessica Rentto 619-594-6017. She (or her designee) will contact you to let you know about accommodations and support services at SDSU and possibilities for holding accountable the person who harmed you. Know that you will not be forced to share information you do not wish to disclose and your level of involvement will be your choice. If you do not want the Title IX Officer notified, instead of disclosing this information to your instructor, you can speak confidentially with the following people on campus and in the community. They can connect you with support services and discuss options for pursuing a University or criminal investigation. Sexual Violence Victim Advocate 619-594-0210 or Counseling and Psychological Services 619-594-5220, psycserv@sdsu.edu. For more information regarding your university rights and options as a survivor of sexual misconduct or sexual violence, please visit titleix.sdsu.edu or sdsutalks.sdsu.edu.

Tentative Schedule

*Table will be amended throughout the semester

Day	Date	Activities
M	August 23	Ice breakers and Zoom breakout groups Syllabus and overview of the course 1.1-1.2, 1.4-1.5
W	August 25	1.3, 1.6, 1.7
M	August 30	1.8 CH1 Lab Exercise
W	September 1	2.1-2.3 HW0 Due
M	September 6	Labor Day – No Class
W	September 8	2.4-2.6
M	September 13	2.7, 2.9-2.10, part of 2.11
W	September 15	CH2 Lab Exercise HW1 Due
M	September 20	3.1-3.3
W	September 22	3.4-3.10 HW2 Due
M	September 27	CH3 Lab Exercise
W	September 29	4.1-4.3 CH3 Lab Cont.
M	October 4	Midterm Examination I
W	October 6	4.4, 4.6 CH4 Lab/HW HW3 Due
M	October 11	5.1-5.13 Yes, a whole chapter!
W	October 13	6.2, Matrix lab HW4 Due
M	October 18	CH6 other topics
W	October 20	CH6 Lab

M	October 25	7.1-7.4
W	October 27	7.5-7.6 Lab Exercise HW5 Due
M	November 1	CH8
W	November 3	CH8 Lab HW6 Due
M	November 8	CH9
W	November 10	CH9 Lab
M	November 15	Midterm Examination II
W	November 17	HW11 Due 10.1-10.4
M	November 22	10.5-10.6 Lab Exercise
W	November 24	No Class
M	November 29	11.1-11.3
W	December 1	11.4-11.6 Lab Exercise
M	December 6	Penalized regression
W	December 8	Additional topics
Final Examination Monday, December 13th 3:30-5:30pm		

Student Resources

Math and Stats Learning Center: The Math and Stats Learning Center is an amazing resource, providing 1-on-1 tutoring services and online office hours via Zoom to assist you in your journey through mathematics and statistics. They are also hiring! More information can be found [here](#).

Writing Center: The SDSU Writing Center promotes student success with writing across the university. The Center works with undergraduate and graduate students from all disciplines to develop and extend their knowledge and performance of academic literacies through coaching from tutors who engage them in conversations about their writing and broaden their understanding of audience, genre, language, and context. More information can be found [here](#).

SDSU Undocumented Resource Area (URA): The Undocumented Resource Area at SDSU is designed to provide undocumented students guidance, support in navigating the campus and local community resources to support their well-being, enhance their educational achievement and timely progress toward a university degree. More information can be found [here](#).

The Pride Center: The Pride Center at San Diego State University creates, sustains, and strengthens an open, inclusive, safe, and affirming gathering space and campus environment for persons of all sexual and gender identities and their allies. More information can be found [here](#).

Resources for Veterans: On campus, and worldwide, the Veteran's Center is committed to supporting military, military veterans, military spouses, and dependent children in the areas of higher education in outreach/admission, GI Bill benefits, academic success, graduation, and a career. More information can be found [here](#).

Financial Aid and Scholarships: Did someone say free money? Find out how you can receive financial assistance for your education [here](#).

SDSU Economic Crisis Response Team: If you or a friend are experiencing food or housing insecurity, or any unforeseen financial crisis, visit sdsu.edu/ecrt, email ecrt@sdsu.edu, or walk-in to Well-being & Health Promotion on the 3rd floor of Calpulli Center.

Counseling and Psychological Services (C&PS): C&PS offers a wide range of services to help students obtain support for a variety of presenting concerns. These include individual counseling, couples counseling, group therapy, workshops, specialized programs, and appointments with Baxter, **C&PS' therapy dog**. More information can be found [here](#).

Additional Resources: [Food pantry](#) [Health Services](#)

Supportive Clubs and/or Organizations: Joining a [club](#) or organization is a fun and instrumental part of your college education.