Stat 315:
Intro. to the Theory and Practice of Statistics

Summer 2024

Instructor:	Aaron Nielsen	**Email:**	aaron.nielsen@colostate.edu
Section/Time:	001 (MTWRF 9:00 – 11:00am)	**Location:**	Wagar 231
Webpages:	`http://canvas.colostate.edu/`		`http://www.webassign.net/`

Course format: This semester's course will be held **in-person**. You are encouraged to attend lectures, however, attendance will not be taken. You are required to complete homework assignments online and take exams in-person on exam dates.

Course credits: 3

Recommended Textbook: *Probability and Statistics for Engineers and Scientists* (any edition) by Jay L. Devore

Required Software: R (It's free and available at `http://www.r-project.org/`) and RStudio (also free and available at `https://rstudio.com/`).

Office Hours: **My office hours are MTWR 11am-12pm** (no office hours on Friday). These are held in the Statistics Success Center (Weber 223A).

For more information about the SSC, see:
`https://statistics.colostate.edu/advising-statistics-success-center/`

Prerequisite: Math 155 or Math 159 or Math 160 (Calculus I). Note that some topics from Calculus 2 and 3 will be used in class, however, we will discuss these methods before using them.

Course overview: Descriptive statistics, probability, conditional probability, random variables (discrete, continuous, multivariate), point estimation, hypothesis testing, confidence intervals, ANOVA, simple linear regression, multiple regression

Learning Objectives: Upon successful completion, students will be able to:
1. Describe any notable features of data based on numerical summary statistics and graphical figures.
2. Apply basic concepts of probability including set theory, the axioms of probability, conditional probability, and Bayes' Theorem.
3. Use methods from Calculus to investigate properties of random variables.
4. Derive point estimates and confidence intervals for unknown parameters and interpret the results.
5. Use p-value based hypothesis testing to test questions regarding unknown population parameters.
6. Investigate the relationship between quantitative variables using simple and multiple regression.
7. Use R software to import data, graph data, produce statistical summaries of data, implement popular model-based procedures, and provide meaningful interpretations of your results.

Online Homework: Online homework will be due on Tuesdays, Wednesdays, and Thursdays by 11:59pm. Late homework is accepted up to one week late for half credit. You need to register for our class at `http://www.webassign.net/` using the code **colostate 0772 1925**. You should not have to pay for this service, as it is covered by student tech fees.

Quizzes: There will be **four in-person quizzes**. You are allowed to use a calculator and a two-sided 4"x6" notecard of formulas/notes. In the event of an instructor-approved, excused absence, the student will have the option to either take a make-up exam within 72 hours of the original exam date or double count their final exam in place of the missed exam.

Basis for Final Grade: Your final grade will be based on your exam scores, weekly homework sets, and intangibles such as class participation. The intangibles can only increase your grade. The weightings will be as follows:

- Online Homework Assignments: 40%
- Quiz #1 (Friday, May 17): 15%
- Quiz #2 (Friday, May 24): 15%
- Quiz #3 (Friday, May 31): 15%
- Quiz #4 (Friday, June 7): 15%

Grading Scale: Your course grade will be determined from the following grading scale:

A	93% – 100%	C+	77% – 80%
A-	90% – 93%	C	70% – 77%
B+	87% – 90%	D	60% – 70%
B	83% – 87%	F	0% – 60%
B-	80% – 83%		

Syllabus updates: The instructor reserves the right to make changes to the syllabus during the semester. These changes will be announced in class and on Canvas.

Course schedule: The following schedule of course materials covered is tentative, but the dates of the quizzes will not change.

Week	Chapters	Topics
1	1–3	Descriptive Statistics, Probability, Discrete Random Variables
2	4–6	Continuous Random Variables, Multivariate Distributions, Sampling Distributions
3	7–9	Confidence Intervals, Hypothesis Testing, Two-Sample Inference
4	10–12	ANOVA, Simple Linear Regression, Multiple Linear Regression

Course Policies:

- **Academic Integrity and CSU Honor Pledge:** This course will adhere to the CSU Academic Integrity/Misconduct policy as found in the General Catalog and the Student Conduct Code. Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course. Further information about Academic Integrity is available at CSU's Academic Integrity - Student Resources.

- **Cheating:** This includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work or engaging in any behavior specifically prohibited by the faculty member. In particular, students are not allowed to communicate with others during exams and are not allowed to use online solutions from any source.

- **Online Homework Helpers:** The use of online "homework helper" sites including, but not limited to, Chegg, NoteHall, Quizlet, Koofers, and ChatGPT is not permitted in this course. Please reach out to your instructor to discuss if a specific service you are thinking about using for this course is acceptable. Use of these types of resources will be considered receiving unauthorized assistance and, therefore, a violation of the student conduct code. Using them may result, at the discretion of the instructor, in a zero for the course, assignment, quiz, or exam. All incidents of this type will be referred to the CSU Student Resolution Center and may be subject to additional University disciplinary action.

- **Late Work Policy:** Online homework may be submitted up to one week late for half credit. No late homework can be submitted after the final exam.

- **Grades of "Incompletes":** I will follow university procedures on "incompletes", i.e., they are only given in situations where unexpected emergencies prevent students from completing the course and the remaining work can be easily finished the following semester. Incomplete work must be finished the next semester or the grade automatically turns into an F.

- **Group Work Policy:** Students are welcome to work together on homework, but note that some WebAssign problems will have different numbers from student to student. You may not use solutions obtained from previous semesters or from online. This is considered academic dishonesty.

- **Students with Disabilities:** The university is committed to providing support for students with disabilities. If you have an accommodation plan, please see me so we can make any arrangements necessary to facilitate your learning.

- **Need Help?** CSU is a community that cares for you. If you are struggling with drugs or alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others please know there is help available. Counseling Services has trained professionals who can help. Contact 970-491-6053 or go to `http://health.colostate.edu`. If you are concerned about a friend or peer, tell someone by calling 970-491-1350 to discuss your concerns with a professional who can discreetly connect the distressed individual with the proper resources (`http://safety.colostate.edu/tell-someone.aspx`). Rams take care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.

- **COVID:** For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site `https://covid.colostate.edu/`.