Course Format	In-Person, MoWe 5:00–6:20pm Dawson 106
Instructor's Information	Sungju Moon, PhD **Primary Contact:** Use the Inbox tool within Canvas **Email:** sungju.moon @ nevadastate.edu **Office Phone:** (702) 992-2725 **Office Location:** Dawson 223 Please note that all official University communication is conducted using NS-issued email addresses (e.g., @students.nevadastate.edu) in order to comply with the Family Educational Rights and Privacy Act (FERPA). If you need assistance finding or accessing your NSU email account, please see the relevant section on the LASB Course Policies and Guidelines page.
Office Hours	Tuesdays 1:00–2:00pm, Wednesdays 4:00–5:00pm and whenever my office door is open Online meetings by appointment on Thursdays and Fridays.
E-mail & Classroom Response Time	You can generally expect a response to e-mails within 24–48 hours (or slightly longer over weekends or holidays). Feedback for completed discussions, quizzes, and assignments depends on the length and complexity of the activity and could take up to 10 days. For questions on the status of a completed assignment, discussion, or test please contact me.
Course Description	Basic statistical methods with emphasis on application, descriptive statistics, graphical presentation, point and interval estimation, hypothesis testing, regression, and experimental design. Satisfies Mathematics Core Curriculum. Pre-requisite(s): Satisfactory score on the math placement test or MATH 96.
Required Text(s)	Chih, T., *Team Based Statistics*. This is a free online textbook available at: https://tienchih.github.io/tbil-stats/book-1.html
Supplemental Materials	RLab assignments will require an R setup. Using R with RStudio is recommended. The classroom computers are equipped with the recommended setup. **An optional reference text: *CourseKata***—A growing number of schools are adopting *CourseKata*, a modeling-first, interactive text for introductory statistics. It offers an excellent foundation and is more readable than our official, activity-based textbook. One caveat is that it uses its own R package, so some syntax may differ slightly from the standard R used in RLab assignments. *CourseKata* is in the process of being formally integrated into NSU Canvas. For now, you can access our dedicated *CourseKata* Canvas shell by enrolling at: https://canvas.instructure.com/enroll/3BN7LT. Please note that **this is not the same Canvas page as NSU Canvas**, so you may be asked to create a separate login by their system.

COURSE
LEARNING
OUTCOMES

This course aims to strike the right balance between theoretical rigor and practical applications.

After finishing this course, you will be able to:

- Use R for statistical analysis, including writing and debugging basic programs, applying good programming practices, and generating reproducible reports with R Markdown.
- Summarize, visualize, and interpret categorical and numerical data using appropriate descriptive statistics and regression methods.
- Critically evaluate statistical studies, including their design, methodology, and conclusions, and conduct a focused literature review based on statistical evidence.
- Explain the relationship between populations, samples, and the role of variability in statistical reasoning.
- Identify the key elements of sound experimental design and assess whether they are present in published studies.
- Select and implement appropriate inferential methods—such as confidence intervals, hypothesis testing, and regression—and correctly interpret their results in context.

PROGRAM
LEARNING
OUTCOMES

This course aligns with the following mathematics Program Learning Outcomes.

Program Learning Outcomes (PLO)	Course Assignment or Activity	Level of Attainment
PLO 6 (Personal Development: Communication) Communicate their ideas to others with the appropriate level of rigor and clarity for the audience.	The term project will require students to conduct a literature review on a topic grounded in statistical studies and to communicate your findings in a clear written paper.	1. The core ideas are communicated either incorrectly or incoherently. 2. The core ideas are communicated, but the presentation is unclear. 3. The core ideas are communicated clearly, but not at the appropriate level for the audience. 4. The core ideas are communicated clearly at the appropriate level for the audience.
PLO 7 (Personal Development: Collaboration) Work in groups to move collaboratively towards a shared goal.	Students will collaborate with one another during every class session. At the beginning of one of these collaborative sessions, students will be introduced to the "Collaboration in Mathematics" document. After the R Markdown files are submitted, students will then be asked to respond to a series of prompts from this document, found in the section titled "How do we evaluate collaboration?".	1. The student indicates negative outcomes within the group context. 2. The student indicates neutral outcomes within the group context. 3. The student indicates the ability to identify positive collaborative outcomes within the group context. 4. The student indicates significant levels of positive collaboration outcomes in the group context.

CLASS
SCHEDULE

See Page 10 of the course syllabus for the tentative course calendar. All dates are subject to change.

ASSIGNMENT
DESCRIPTION
& DUE DATES

Daily Team Based Statistics Reports (TBS Reports; 30%): In each class session, students will work in pairs on activities from our digital textbook, many of which involve using R. At the end of each week, your will submit the week's TBS reports (typically two, since we meet on Mondays and Wednesdays). You can choose to submit your individual TBS report or submit one as a team (with your partner from in-class activities). Reports should include the activity problems from the sections covered, all relevant code, and discussion reflections. Reports can be submitted as HTML or PDF formats generated from R Markdown.

TBS reports will be graded on the following scale:

- (5 points) Correct computations, thoughtful discussion, and excellent report quality.
- (4 points) Correct computations and thoughtful discussion, but report quality needs improvement.
- (3 points) Complete work with minor errors or limited discussion depth.
- (2 points) Major components are missing or incorrectly executed.
- (1 point) Submitted with honest effort but lacking substance.

Statistical Literature Review Project (Term Project; 30%): This semester-long project involves conducting a literature review on a topic of your choice, ideally connected to your major or personal interests. You can work as a group (up to 3 people in a group). The purpose is to explore how statistics is applied in real research studies and to develop your ability to read, interpret, and synthesize statistical findings. Milestones throughout the semester will guide your progress. Final deliverables include a written paper and an in-class presentation.

RLabs (25%): Over the semester, you will complete five RLab assignments. These coding exercises go beyond daily activities and require deeper engagement with statistical methods and programming in R. Reports must be written in R Markdown, and you will submit both the `.rmd` file and the output (HTML or PDF). While you may collaborate with peers, each student must submit their own individual report. RLab grading follows the same scale as TBS reports.

Extracurricular Activities (15%): You will compile a portfolio of your extracurricular activities completed during the semester, to be submitted at the end of the term. See Page 8 for details.

EXAM
DESCRIPTION

There will be no formal exam in this class.

LATE WORK
POLICY

If for some reason you are absent due to an extenuating circumstance or medical situation, please report the incident using the Student Absence Notification System. Instructors will then review the information in the SANS to determine how, or whether it's possible, to address missed or late work.

The following assignments may *not* be turned in late for credit without explicit permission from the instructor:

- TBS Reports
- RLabs
- Milestones for the Term Project
- Extracurricular Portfolio

You cannot receive a passing grade for the course without completing all major assessments, which include the RLabs, term project milestones.

ATTENDANCE
EXPECTATIONS

There may be days you do not to attend classes or leave early due to past or ongoing crises or distressing circumstances. Disclosure of specific reasons or details is not expected, but it will be helpful if you could communicate with me about instances of missed sessions or work; this is because (1) frequent or prolonged inactivity with regard to course contents will negatively impact your learning, and (2) open communication will help us reformulate missed assignments to suit your situation. Missing five consecutive class sessions or assignments without prior or follow-up notice will prompt me to check in with you for a 'pulse check'. Please know that I am available to provide resources and connect you to support services.

GRADING
CRITERIA

Your grade will be determined by the following rubric:

(Course Point Totals)—100%

- TBS Reports (30%)
- Term Project (30%)
- RLabs (25%)
- Extracurricular Activities (15%)

Grading Scale (Letter Grade and Point Range):

A	93% or higher	B-	80%–82.99%	D+	67%–69.99%
A-	90%–92.99%	C+	77%–79.99%	D	63%–66.99%
B+	87%–89.99%	C	73%–76.99%	D-	60%–62.99%
B	83%–86.99%	C-	70%–72.99%	F	less than 60%

Accessing Grades and Instructor Feedback

To access your grades and find the instructor's feedback, click on Grades in the left menu. Scroll through the list until you find the new graded assignment (indicated by the blue dot to the left of the assignment name). Then click on the assignment name. You will see your grade. Below it you can click on Show Rubric to see the marked up rubric. Click on the paper title if you want to download the original document. (The instructor's marks or comments will not appear on the downloaded document.) Click on the box to the right of the paper title to see the Turnitin report. Click on View Feedback to see the paper marked up with the instructor's comments/corrections in DocViewer. The instructor's feedback is on the right. Accessing Grades will take you step-by-step through how to find all instructor feedback and see the marked-up paper and rubric.

ARTIFICIAL
INTELLIGENCE
(AI) POLICY

What Is AI? AI tools are applications and other generative technologies capable of producing content (e.g., generating, summarizing), offering feedback (e.g., revising, translating), researching, assisting with coding, or other tasks typically done by humans. Examples include, but are not limited to, ChatGPT, Grammarly, Bing Copilot, Google Gemini, Grok, Answers.AI, Quillbot, Claude AI, DeepL, DeepAI, DALL-E, etc.

AI Tools Banned on State-Owned Devices. The State of Nevada has banned (link) some AI tools (and other technology) due to security or intellectual property concerns. You cannot use these tools on University-owned computers or other devices:

- Grammarly (public version)
- DeepSeek AI

The State updates the banned technology list occasionally, so other tools may be added. You are responsible for checking the most updated list to ensure you are not using any banned tools on state-owned devices.

AI Use Policy for This Course.

- *Prohibited Uses.* As a student in this course, you are not allowed to use AI assignments in the following ways:
    - Generating full essays, reflections, or academic papers
    - Generating answers for homework assignments
    - Generating plots and graphs for assignments and projects
    - Submitting wholly AI-generated programming code

- *Permitted Uses.* You are allowed to use AI in the following ways:
    - Checking grammar and spelling
    - Tutoring or study help (e.g., generating example questions)
    - Generating artificial data to be used in mini-projects (with AI attribution)
    - Research assistance or finding sources
    - Brainstorming or outlining ideas for papers or projects (with AI attribution)
    - Converting from one programming language to another for testing purposes (with AI attribution)
    - Generating visualizations for your own use (not for submission)

If you are unsure how AI can be used for a specific assignment, talk to the instructor before you get started.

AI Citation. This class does not require a specific citation style. The example below, in AMS style, may be used for AI attribution:

[1] OpenAI ChatGPT-version chat response to prompt "Your prompt goes here," 2025.

In text citation example: "...according to ChatGPT [1]..."

Consequences for Misuse. Misuse of AI may result in plagiarism or academic misconduct penalties outlined in the NS Student Code of Conduct and/or the LASB Academic Conduct Policy (found under Resources & Policies). Continued misuse of AI in coursework or across courses will result in escalating consequences based on the severity and frequency of the violation, which could include receiving an F in this course, academic probation, suspension, or expulsion.

LASB Course Policies & Guidelines

All courses in the School of Liberal Arts, Sciences, and Business (LASB) are subject to LASB course policies and guidelines. You are responsible for reading, understanding, and abiding by these policies and guidelines.

Student Support & Resources

Academic Advising Center. The Academic Advising Center is a dedicated team of Advisors committed to your academic success at NS. By providing the right advice and guidance, we helpe students meet their educational and personal objectives. Please visit Academic Advising Center.

Writing Center. Supporting every NS student's ability to improve their process and product, the Writing Center provides trained readers for all writers, all projects, in all disciplines, and during all stages.

Academic Success Center (Tutoring). The Academic Success Center (ASC) offers a range of services including free one-on-one and group tutoring sessions where students can review and practice course concepts and relevant study/test taking strategies with trained peer tutors.

NetTutor Online Tutoring—Did you know you can receive a free on-demand academic support at your convenience when the ASC is closed? You can submit a question or request a drop-in session for a specific subject with an e-instructor. The majority of NetTutor e-instructors have a Master's or Ph.D. in the field. You can access NetTutor through Canvas by selecting the "NetTutor Online Tutoring" on the left-side navigation bar in each of your courses.

Scorpion Success Network. If the instructor determines your performance in this class is placing you at academic risk, you may be referred to a member of the Academic Advising Center. An Academic Advisor will work with you to address issues and develop a student success strategy. Regardless of whether a referral has or has not been made, you are ultimately responsible for tracking your own progress in this course. If you would like to meet with an Advisor regarding any academic struggles you are experiencing, please contact Academic Advising at 702-992-2160 or at studentsuccess@nevadastate.edu.

Student Wellness Services. If you are struggling with hunger, unstable housing, safety, mental health worries, or ANY other concerns, contact Student Wellness. Email: studentwellness@nevadastate.edu | Call (702) 992-2514.

Disability Resources. At Nevada State University, we recognize our responsibility and embrace the opportunity to meet the unique educational needs of students with documented disabilities. The staff of the Disability Resource Center (DRC) is dedicated to providing a coordinated program of support services for students qualifying with disabilities under the Americans with Disabilities Act (ADA) and Section 504 Guidelines. Our mission is to ensure that all students qualifying with disabilities have equal access to participate in, contribute to, and benefit from all university programs, classes and activities. Confidential, sensitive, and individualized services are provided free of charge, on a case-by-case basis.

Any student who believes s/he may need accommodations, based on the impact of a documented disability, should contact the DRC Office to speak privately with the Director of the DRC about specific needs. To make an appointment, please contact the DRC office at (702) 992-2180 or by email at `drc@nevadastate.edu`.

Veteran Concerns. If you are a veteran who is struggling academically or have concerns please contact the DRC office at (702) 992-2180 or by email at `drc@nevadastate.edu`.

Extracurricular Activities & Portfolio Guide

Portfolio

At the end of the semester, you will submit a portfolio containing the extracurricular activities you completed during the term. Your portfolio should begin with a one-paragraph narrative summarizing your activities, followed by the supporting materials or artifacts.

You must complete at least 3 activities of distinct types from the list and include them in your portfolio. Each activity is worth up to 5 points, for a total of 15 points.

Grading Scale

- 5 points: Complete activity with strong supporting artifact and clear narrative
- 4 points: Complete activity, but portfolio entry is missing part of the artifact or has a flawed narrative
- 3 points: Activity completed with minor flaws
- 2 points: Activity completed with major flaws
- 1 point: Attempt made (artifact or narrative present, but not both, or both incomplete).

If you complete more than 3 activities (of any type), each additional one may earn up to 1 extra point for effort, but the total portfolio grade is capped at 15 points.

Activities List

1. **MDS Club Activities.** Participate in at least two different kinds of Math & Data Science (MDS) Club events, such as Math Colloquium, Astronomy Night, or Tuesday Tea, and write brief reflections (1–2 paragraphs each) about your experiences. Announcements for upcoming MDS Club events will also be posted on Canvas.

2. **Reading Reflections.** Pick up a book related to course content and write a reflection (about 1 page-long) explaining how specific topics discussed by the author connect to some of the statistical ideas or applications of statistics discussed in class. You do not have to have read the entire book to write your reflection. Below are some suggested readings you can check out:
   - Porter, Theodore M., *The Rise in Statistical Thinking, 1820–1900*
   - Gigerenzer, G. et al., *The Empire of Chance*
   - Stigler, Stephen M., *The History of Statistics*
   - Ellenberg, Jordan, *Shape*
   - Silver, Nate, *The Signal and the Noise*
   - Delvin, Keith, *The Unfinished Game*
   - Taleb, Nassim N., *The Black Swan*
   - Kahneman, Daniel, *Thinking, Fast and Slow*
   - Tufte, Edward R., *The Visual Display of Quantitative Information*

3. **CourseKata.** Complete at least one of the first twelve chapters from the optional *CourseKata* textbook. You can access our dedicated *CourseKata* Canvas shell by enrolling at: https://canvas.instructure.com/enroll/3BN7LT. Your portfolio artifact should include a screenshot showing your progress.

4. **Data Visionary.** Collect your own data (e.g., via survey) or use a reliable database (e.g., NCEP Reanalysis Data) and conduct a statistical analysis. Produce a 1–2 page report using the tools learned in class. Alternatively, you may focus entirely on creating an insightful data visualization. This activity can also contribute to your term project.

5. **The YouTuber.** Create a short explainer video on a statistical concept covered in class (e.g., the central limit theorem). You may narrate your explanation or use visual aids. Submit either the video link (if published) or the video file itself as your artifact.

6. **Software Guru.** Explore a tool or package not covered in depth in class (e.g., R's mosaic package). Produce a short "cookbook" with at least one worked example to demonstrate your understanding.

Course Schedule

ALL DATES ARE SUBJECT TO CHANGE

Date	Agenda	Assigned	Due[†]	Final Proj.
Mon, Aug 25	What is Statistics?			
Wed, Aug 27	Variables (B1), Sampling (B2)			
Mon, Sep 1	Labor Day			
Wed, Sep 3	Intro to R/R Markdown	RLab 1		
Mon, Sep 8	Visualizing Data (B3)	TBS Reports		Project Guide
Wed, Sep 10	Centers of Data (B4)		Rlab 1	
Mon, Sep 15	Variation of Data (B5)			
Wed, Sep 17	Work on RLab 2	RLab 2		Topics/Theme
Mon, Sep 22	Standard Normal Distribution (D1)			
Wed, Sep 24	Library Session		RLab 2	
Mon, Sep 29	General Normal Distribution (D2)			
Wed, Oct 1	Counting Principles (D3)			Finalized Topics
Mon, Oct 6	Binomial Distribution (D4)			
Wed, Oct 8	Normal Approximation (D5)			
Mon, Oct 13	Work on RLab 3	RLab 3		
Wed, Oct 15	Point Estimates (F1)			Bibliography Check
Mon, Oct 20	Confidence Intervals (F2)			
Wed, Oct 22	Hypothesis Testing (F3)		RLab 3	
Mon, Oct 27	Categorical Variables (C1–2)			
Wed, Oct 29	Chi-Squared Test 1 (C3)			Critical Review
Mon, Nov 3	Chi-Squared Test 2 (C4)			
Wed, Nov 5	Work on RLab 4	RLab 4		
Mon, Nov 10	t-Variable (N1–2)			
Wed, Nov 12	Paired Numerical Data (N3–4)		RLab 4	Paper Outline
Mon, Nov 17	ANOVA (N4–5)			
Wed, Nov 19	Linear Correlation (R1)			
Mon, Nov 24	Linear Regression 1 (R2)			
Wed, Nov 26	Work on Final Project			Full Working Draft
Mon, Dec 1	Work on RLab 5	RLab 5		
Wed, Dec 3	Linear Regression & inference (R3)			
Mon, Dec 8	Final Presentations			Final Slides
Wed, Dec 10	Final Presentations (if needed)		RLab 5	Final Paper due Fri

[†] TBS reports are due on Fridays of the same week.