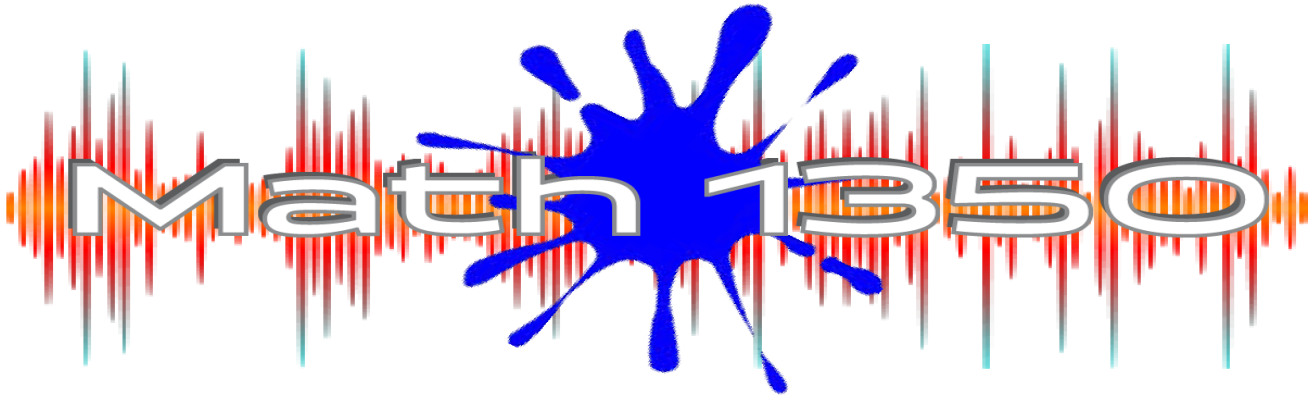

Summer 2026

Instructor: Nick Lucas

Virtual Office Hours: Thursdays 6:00 – 8:00pm

Phone: 974-5862

Email: nlucas@unm.edu

Course Description

Math 1350 course discusses the fundamentals of descriptive and inferential statistics. Students will gain knowledge in topics such as descriptive statistics, probability and basic probability models used in statistics, sampling and statistical inference, and techniques for the visual presentation of numerical data. These concepts will be illustrated by examples from a variety of fields. Although introductory statistics courses are often thought of as just another math class, this course focuses on the understanding and application of statistics rather than the underlying theoretical and computational aspects which often leave the student with a mindful of formulae but little understanding of their application and interpretation.

There is no assigned textbook for this class. However, additional online resources will be made available. All material for the class shall be presented in downloadable lecture notes and instructional videos. All homework assignments and any extra credit assignments can only be obtained through the class portal. Each week, students will need to watch the assigned instructional video, participate in a class discussion relevant to the topics covered in that week's lecture, and work on the assigned homework problems.

Students are encouraged to send the instructor questions as needed and participate in class discussion boards. Students are also encouraged to utilize the instructor's virtual office hours. Time management is also extremely important. If you don't plan sufficient time for studying class materials and watching instructional video, you will always find yourself behind and confused. This class requires participation, effective communication, organization, patience, and the motivation to learn. Your participation in this class is your responsibility and the consequence for non-participation is also your responsibility. **Students requiring a reasonable accommodation are asked to contact the instructor immediately.**

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Student Learning Outcomes

1. Explain the general concepts of statistics.
    a. Explain and evaluate statistics used in the real world (from a news article, research project, etc.).
    b. Use statistical vocabulary appropriately.
    c. Distinguish between descriptive and inferential statistics.
    d. Distinguish between qualitative and quantitative data.
    e. Distinguish between populations and samples, and parameters and statistics.
    f. Give examples of independent and dependent variables.
2. Presentation and description of data.
    a. Present data graphically using histograms, frequency curves and other statistical graphs.
    b. Interpret graphs of data, including histograms and shapes of distributions.
3. Summarize data using measures of central tendency and variation.
    a. Calculate and interpret the mean, median, and mode to describe data.
    b. Calculate and interpret range, variance, and standard deviation to describe data.
4. Present the concepts of probability.
    a. Interpret basic probabilities.
    b. Calculate probabilities using the standard normal distribution and relate them to areas under the curve.
    c. Describe the relationship between the sampling distribution and the population distribution.
    d. Use the central limit theorem to approximate the probability distribution and calculate probabilities.
5. Compute point and interval estimates.
    a. Determine the confidence interval for a parameter.
    b. Interpret the confidence level and margin of
    c. Determine whether a statistical technique is appropriate under stated conditions.
6. Perform hypothesis tests.
    a. Determine whether a statistical test is appropriate under stated conditions.
    b. Identify null and alternative hypothesis.
    c. Perform and interpret statistical tests (e.g. z-test, t-test, one-tailed and two-tailed, one-sample, two-sample) and determine whether data is statistically significant.
    d. State the conclusion of a hypothesis test.
    e. Interpret a p-value as compared to a significance level.
    f. Explain why a test can lead us to reject a null hypothesis, not accept one.
    g. Distinguish between Type I and Type II errors.
7. Analyze data using regression and correlation.
    a. Explain the difference between correlation and causation.
    b. Construct and interpret scatter plots.
    c. Calculate and interpret the linear correlation coefficient.
    d. Determine and use the equation of a least-squares regression line between two variables to make predictions.
    e. Interpret the meaning of the coefficient of determination.
8. Optional topics.
    a. Inter-quartile range, box-plots, stem-and-leaf plots.
    b. Statistical power.
    c. Chi-square.

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Learning Objectives

1. Descriptive Statistics, Data Production and Inference: Students will be able to explain basic vocabulary, logic, and procedures for data exploration, data production, and statistical inference.

2. Data Exploration: Students will be able to explain principles of data exploration and differentiate between quantitative and categorical variables. Students will illustrate by way of graphs and the use of tables how to interpret data. They will identify the underlying principles and measures used to analyze this data.

3. Procedures for data production: Students will demonstrate that they can use tables of random numbers to perform simple random sampling to obtain samples from populations. They will show that they can distinguish differences between observational studies and experiments. Students will demonstrate techniques for the design of a controlled experiment.

4. Sampling Distributions: Students will be able to recognize and apply the terms population, sample, parameter and statistics as they pertain to sampling distributions. They will apply the concept of the Law of Large Numbers and Central Limit Theorem. They will demonstrate the ability to obtain the sampling distribution of sample means and spread of a population.

5. Making Inferences: Students will demonstrate an understanding for the procedures involved in making inferences about quantitative populations.

6. Tests for Independence of two categorical variables: Students will be able to interpret 2-way tables, stating hypothesis, calculating expected counts and using Chi Square distribution to test for independence.

How to Communicate with Your Instructor

Students are encouraged to call, email, or message me at ANY time. I will do my best to get back with you as soon as possible. Students can also message me through the class site on CANVAS. The virtual office hour listed on the first page is the best time to reach me, however, I am happy to respond to messages throughout the day when I can.

Tel: 974-5862 Email: nlucas@unm.edu

Homework

There will be 9 homework assignments. These assignments will consist of short answer problems and problems to be worked using Microsoft Excel. Each homework assignment is worth 20 to 30 points. Credit is given based on the amount of effort shown in your work and not the number of correct or incorrect answers. In order to obtain full credit, all work **must** be shown, including all work done in Excel (Refer to the Assignments Rubric for more information on grading criteria). ***Homework assignments must be received by the assigned date and time. No late assignments shall be accepted – no exceptions.***

Review Exercises

From time to time, students will be given exercises to review the material just presented. These exercises will provide students the opportunity to earn extra credit. Although there is no specific number of exercises planned, students can expect to have the opportunity to earn no less than 50 points extra credit. Review Exercises are graded using the Assignments Rubric.

Discussion Boards and Participation

Students are required to actively participate in the weekly discussion boards. Students are required to respond initially to the discussion board question by initiating an Original Thread. The Discussion Board is where we assess your participation as if you were in a regular in-person class. You are expected to be an active and engaged member of the class. You are required to participate in all discussion posts during the semester. Discussion posts take numerous forms. They could involve responding to questions and commenting on the lecture presentations as well as answering another student's questions regarding the material.

Each discussion board assignment is worth 20 - 30 points. In order to receive full credit for these posts, you must fulfill some basic requirements as defined in the *Discussion Board Rubric*. This includes waiting at least two days *after* posting your original thread before replying to three other students' posts. This requirement is intended to increase interaction with the class site and conversations with other students. Active participation in the Online discussions helps create a learning community and gives you opportunities to work with and get to know other students. Discussion questions and instructions are located in the *Discussion Board* section of the course site.

Exams

There will be four exams. Students should use a UNM campus computer to take the exam or a computer connected to the Internet using an Ethernet cord (not WiFi). The first three exams are worth 130 points each. Exams will include material from the video lecture, notes, homework assignments and review exercises. Exam questions will consist of multiple-choice and short answer items. Class materials will not be available while taking exams. Students will use Microsoft Excel during exams and will need to attach all work completed in Excel to receive any credit. The fourth or final exam will cover hypothesis testing using parametric and non-parametric statistical methods. The final exam is worth 210 points. Students may only make-up missed exams if they have contacted the instructor at least 24 hours prior to the exam due date.

Grades

Your final course grade will be computed from the four test scores, nine homework scores, and points earned from participating in the discussion boards. The table below provides a detailed breakdown of how each component in the class contributes to your final grade.

Course Component	How Many?	Points Each	Total Points Possible	Percentage of Final Grade
Homework Assignments	9	20 - 30	250	25%
Discussion Forums	7	20 - 30	150	15%
Exams	3	130	390	39%
Final Exam	1	210	210	21%
TOTALS			**1000**	**100%**

There are a total of 1000 points possible for the course (Discussion Board Participation @ 150 points; 9 homeworks @ 250 points; three exams @ 390 points; and the final exam @ 210 points; for a total of 1000 points possible for the class). The assignment of final letter grades will be contingent on the total class performance. However, students may expect the following grading distribution to be used in lieu of the total class performance: A = > 899, B = > 799, C = > 699; 699 and below → Instructor's Withdrawal (or 'W').

Academic Dishonesty

Students may work with one another on assignments but each must contribute an equal share. In other words, each student must understand the concept and be able to perform the skill on his/her own. Copying or relying on another student for answers is considered cheating. If it is found that a student committed any infractions of honest academic process, he or she will lose credit for the assignment or assessment, may be dropped from the course, lose credit, and/or Fail the course.

Accessibility Support

Accommodations: UNM is committed to providing equitable access to learning opportunities for students with documented disabilities. As your instructor, it is my objective to facilitate an inclusive classroom setting, in which students have full access and opportunity to participate. To engage in a confidential conversation about the process for requesting reasonable accommodations for this class and/or program, please contact Accessibility Resource Center (https://arc.unm.edu/) at arcsrvs@unm.edu or by phone at 505-277-3506.

UAP 2720 and 2740

Our classroom and university should always be spaces of mutual respect, kindness, and support, without fear of discrimination, harassment, or violence. If you ever need assistance or have concerns about incidents that violate this principle, please access campus support resources. These include confidential services at LoboRESPECT Advocacy Center, the Women's Resource Center, and the LGBTQ Resource Center. The University of New Mexico prohibits discrimination on the basis of sex (including gender, sex stereotyping, gender expression, and gender identity). UNM faculty and graduate teaching assistants are considered "responsible employees." "Responsible employees" must communicate reports of sexual harassment, sexual misconduct and sexual violence to Compliance, Ethics and Equal Opportunity. For more information on the campus policy regarding sexual misconduct, reporting, and reporting for "responsible employees," please see UAP 2720 and UAP 2740.

Student Support

Confidential services for students are available at LoboRESPECT Advocacy Center, Women's Resource Center, and the LGBTQ Resource Center. The Women's Resource Center supports all students, including those who are pregnant or are parents. UNM Pregnancy and Parenting Support information is available.

Instructor Support: Information about how to handle disclosures and provide a referral is available on the Title IX Coordinator page. Seek help from your Associate Dean or Dean of Instruction and the Title IX coordinator. Ombuds Services offers workshops that include handling disclosures of sexual harassment. UNM representatives participate in Action Collaborative on Preventing Sexual Harassment in Higher Education.

Credit-hour statement

This is a three credit-hour course delivered in an entirely asynchronous online modality over 8 weeks during the Summer 2025 semester. Please plan for a *minimum* of 18 hours per week to learn course materials and complete assignments.

Student Support

Resources to support study skills and time management are available through Student Learning Assistance at the Center for Teaching and Learning in Zimmerman Library or online.

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CLASS SCHEDULE

Week	Chapter	Material Covered
6/1	1 & 2	Introduction; Why statistics? What is data? Scales of measurement; Populations versus samples; Types of variables; Research Designs; Sampling methods; Describing Data: Pie Charts, Bar Graphs, and Histograms.
6/8	3	Describing Data: Measures of Central Tendency; Describing Data: Measures of Central Tendency and Variability
6/14		**EXAM1: Must be completed by 11:59p.m., Sunday, 6/14. Covers Chapters 1, 2, & 3; HWs 1 - 2; Rev Exercises 1 & 2**
6/15	4	Examining relationships between variables: Correlation between two variables and testing the statistical significance between two variables
6/22	5	Bivariate Linear regression
6/28		**EXAM 2: Must be completed by 11:59p.m., Sunday, 6/28. Covers Chapters 4 & 5; HWs 3 & 4; Rev Exercises 3 & 4**
6/29	6	The Normal Distribution; Finding areas under the normal curve; Standard error of sampling distributions
7/7	7	Confidence Intervals; Using Student's *t* – distribution; How does sample size affect estimating population values?
7/12		**EXAM3: Must be completed by 11:59p.m., Sunday, 7/12. Covers Chapters 6 & 7; HWs 5 & 6; Rev Exercises 5 & 6**
7/13	8 & 9	Hypothesis testing; One Sample *t*-test; Statistical errors; Statistical Power; Significance tests comparing population means; The link between confidence intervals and significance tests; The matched-pairs *t* – test and the independent-groups *t* – test.
7/20	10	Nonparametric Tests: The One-Way and Two-Way Chi-square tests
7/26		**FINAL EXAM: Must be submitted by 11:59p.m., Sunday, July 26, 2026. Covers Chapters 8, 9, 10, Homeworks 7-9 and Review Exercises 7 - 9. Exams received after the deadline will NOT be accepted. No exceptions.**