INTRODUCTION TO PROBABILITY AND STATISTICS
MATH 145 (3 credit hours)

I. GENERAL INFORMATION:

Instructor: Office Number:
Office Hours: Email:

II. COURSE DESCRIPTION:

Students will learn: measures of central tendency and variability (mean, median, mode and standard deviation); frequency distributions; correlation and linear regression; the normal curve; probability; binomial distributions; and hypothesis testing using statistical tests. Prerequisite: MATH 130 or 130L.

III. STUDENT LEARNING OUTCOMES: At the end of this course, students will be able to:

**Explain the general concepts of statistics**
- Understand how statistics is used in the real world.
- Distinguish between descriptive and inferential statistics.
- Distinguish between qualitative and quantitative data.
- Give examples of a population, a sample, independent and dependent variables, parameters and statistics.

**Presentation and description of data**
- Present data graphically using histograms and frequency curves.
- Interpret graphs of data, including histograms and shapes of distributions.
- Calculate and interpret the mean, median, and mode to describe data.
- Calculate and interpret range, variance, and standard deviation to describe data.
- Calculate and interpret z-scores for a normal curve and compute areas under a normal curve using tables.

**Analyze data using regression and correlation**
- Construct and analyze scatter diagrams.
- Calculate the linear correlation coefficient and use this to decide whether a linear relationship exists between two variables.
- Find the equation of a least-squares regression line between two variables.
- Graph a least-squares regression line.

**Present the concepts of probability**
- Define vocabulary related to probability (e.g. mutually exclusive events and independent events).
- Define and apply rules of probability.
- Apply counting principles.
- Calculate probabilities using a binomial distribution.
- Determine if the binomial distribution can be approximated with the normal distribution.
- Construct and interpret a probability distribution.
- Calculate probabilities using the standard normal distribution by finding the area underneath the curve.
- Explain the Central Limit Theorem.

**Compute point and interval estimates**
- Estimate the associated confidence interval for a sample mean.
- Explain the meaning of the confidence level.
Perform hypothesis tests
Use a statistical test (e.g. z-test, t-test, one-tailed versus a two-tailed test) to determine the veracity of a hypothesized claim.
Determine whether data is statistically significant.
Distinguish between Type I and Type II errors.

IV. GRADING

Grades will be determined according to the weighting scheme:

(This is just a sample. The actual percentages will be determined by the instructor.)

Three Exams: 45 %
Quizzes: 15 %
Homework and Project: 15 %
Final Exam: 25 %

Course Grading Scale I: The following grading scale will be used to determine your final letter grade:
A = 90 – 100%
B = 80 – 89%
C = 70 – 79%
D = 60 – 69%
F = 0 – 59%

Course Grading Scale II: The following grading scale will be used to determine your final letter grade:
A+ = 99 –100%
A = 93 –98%
A- = 90 – 92%
B+ = 88 – 89%
B = 83 – 87%
B- = 80 – 82%
C+ = 78 – 79%
C = 70 – 77%
C- = 68 – 69%
D+ = 66 – 67%
D = 63 – 65%
D- = 60 – 62%
F = 0 – 59%
V. TEXTS/MATERIALS:

Text(s): Consult NNMC bookstore for textbook and edition

Tool(s): Scientific calculator
Access to Microsoft Excel or another spreadsheet program is recommended

VI. STUDY ASSISTANCE:

Northern New Mexico College provides tutors at the Student Success Center and the Math Center. Tutors are available to answer questions and to assist students, but they do not complete students’ homework.

VII. STUDENTS WITH DISABILITIES:

Northern New Mexico College recognizes its responsibility for creating an institutional climate in which all students can succeed. Northern is committed to providing equitable access to learning opportunities. The Accessibility and Resource Center (ARC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990; if you have a documented disability, you may request accommodations to obtain equal access and to promote your learning in in all classroom settings. Please contact the Coordinator of Accessibility and Resource Center to inquire about appropriate accommodations. Contact Verna A. Trujillo either via email; v.trujillo@nnmc.edu or by phone; (505) 747-2152. After your eligibility is determined, you will be given a letter, which when presented to instructors, will help us know best how to assist you.

VIII. STUDENT CODE OF CONDUCT AND ACADEMIC DISHONESTY POLICY:

Students in this course and in all college classes are expected to complete their course work in accordance to our College policies. Academic dishonesty on the part of a student including cheating on a test, plagiarism or falsification will be subject to academic sanctions. For more information about academic dishonesty and how such incidents will be handled by your instructor and by the College, please refer to Northern’s student handbook.