MATH 345 Elements of Probability and Statistics
Spring 2015 Syllabus

Instructor: David Torres
Instructor Email: davytorres@nnmc.edu
Office: GE 119A
Office Hours: Mondays and Wednesdays, 10:00-11:00
Tuesdays and Thursdays, 11:15-12:15
Course Location and Time: Tuesdays and Thursdays 12:45-2:00

Course Length: 3 credit hours
Prerequisite: Math 162
Required Textbook: Understanding Statistics in the Behavioral Sciences by Robert Pagano

Supplementary requirements: Scientific calculator and computer access.

Course Description: Students will study probability theory, including combinatorics, probability distributions, expectation, variance, correlation, confidence intervals, and hypothesis testing. Statistical tests (e.g. z-test, t-test, Chi-squared, ANOVA) will be discussed and used in applications.

MATH 345 meets the following College Wide Goals.

A. Communication:
   - Students will solve problems and present their solutions to the class.

B. Critical thought:
   - Students are required to analyze and synthesize information and draw reasoned conclusions.
   - Students will analyze and solve real world problems (e.g. whether trials are sufficient to merit manufacturing a drug).

Course Topics:

1. Binomial distribution and normal approximation
2. Probability
   a. Multiplication and Addition Rule
   b. Counting principles
3. Probability distributions
   a. Probability density and cumulative distributions
   b. Expected values
   c. Normal distribution
d. Poisson, Exponential and Gamma distribution  
e. Joint distributions  

4. Hypothesis testing  
a. Alternative and null hypothesis  
b. Decision rule  
c. Type I and Type II errors  
d. Power  
e. One- and Two-Tailed Probability Evaluations  
f. Sign test  

5. Sampling distributions, Central Limit Theorem, z-test  

6. Student’s t test for single samples, Confidence intervals  

7. Correlation and regression  

8. Student’s t test for correlated and independent groups  

9. Analysis of variance  

10. Chi-Square and nonparametric tests  

Course Requirements:  

1. **Attendance and Quizzes:** Students are expected to attend all class sessions and are responsible for material missed during any absence. Short quizzes will often be given at the end of class. The objective of the quizzes is to test students’ understanding of the material covered in class and to prepare them for exams.  

2. **Homework:** Completing the homework is essential to understanding and mastering the course material. Late homework earns no credit unless caused by extenuating circumstances as determined by the instructor. A longer project assignment will also be assigned during the semester. Assignments turned in two weeks late earn no credit even under extenuating circumstances.  

3. **Exams:** There will be two in-class exams and a comprehensive final exam. The exam dates and topics will be announced at least one week in advance.  

4. **Evaluation:** Grades will be determined according to the weighting scheme:  

   Two Exams: 40 %  
   Quizzes: 10 %  
   Project: 5 %  
   Homework: 20 %  
   Final Exam: 25 %  

**Course Grading Scale:** The following grading scale will be used to determine final letter grades:  

- **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%

Important note: Grades of C- and below do not count toward graduation and do not meet the criteria for satisfying prerequisites.

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 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.

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.