



Course Number Course Name	Math 3345 Elements of Probability and Statistics and Probability Theory
Credit Value (Breakdown of theory and lab credits)	3 Theory
Catalog Course Description	Students will study probability theory, including combinatorics, probability densities, expectation, variance, correlation, estimation, confidence intervals, and hypothesis testing. Statistical tests (e.g. t-test, Chi-squared, ANOVA) will be discussed and used in applications related to biostatistics, social science and environmental science. Prerequisite: MATH 1510. (3, 3T+0L)
Student Learning Outcomes/Objectives /Competencies of the Course	<p>Student Learning Outcomes: At the end of this course the student will be able to:</p> <ol style="list-style-type: none"> 1. Binomial distribution and normal approximation 2. Probability <ol style="list-style-type: none"> a. Multiplication and Addition Rule b. Counting principles 3. Probability distributions <ol style="list-style-type: none"> a. Probability density and cumulative distributions b. Expected values and variance c. Poisson, Exponential and Gamma distribution d. Joint distributions 4. Hypothesis testing <ol style="list-style-type: none"> 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
College-Wide Student Learning Outcomes	<p>Math 3345 learning objectives align with the following NNMC College Wide Goal:</p> <p><i>Critical thought: Students are required to analyze and synthesize information and draw reasoned conclusions.</i></p>