



COURSE SYLLABUS

Course: Introduction to Statistics

Number: MAT 3280

Credit-Hours: 4 Credits

Course Description: An introduction to statistics (non-Calculus based). Frequency distributions; their graphic and tabular representations; measures of central tendency, of dispersion and of correlation; sampling; elementary probability theory; linear regression, the Central Limit Theorem.

Prerequisites: MAT 1060 or 1110 (high school Algebra II or equivalent)

Detailed Syllabus:

0. Getting Started

1. Email and Chat
2. Learning About the Course
3. Software Fundamentals

1. Simulations

- a. Uniform Distributions

2. Data Analysis

- a. Frequency
- b. Expected Value
- c. Cumulative Distributions
- d. Variance
- e. Histograms
- f. Related formulas for Expected Values and Variance

3. Probabilities

- a. Calculating Probability
- b. Union and Intersection and Probability
- c. Conditional Probability Formula
- d. Independence
- e. Indicator functions

4. Normal and Exponential Distributions
 - a. Approximately Normally Distributed Sets
 - b. Normal Distribution
 - c. Approximately Exponentially Distributed Sets
 - d. Exponential Distribution

5. Random Variables
 - a. "Random Variables"
 - b. Discrete Random Variables
 - c. Expected Values and Variance
 - d. Mean, Median, and Mode

6. Joint Distributions
 - a. Joint Probability Calculations
 - b. Discrete
 - c. Expected Values, Covariance, and Correlation.
 - d. Conditional Probability Calculations
 - e. Conditional Expectations
 - f. The Law of Total Probability

7. Central Limit Theorem
 - a. Generating Functions for Discrete Random Variables
 - b. Central Limit Theorem

8. Statistics
 - a. Sampling
 - b. Confidence Intervals
 - c. Hypothesis testing