Probability & Statistics Course Syllabus

Course Description: Probability and Statistics will introduce students to exploring data, sampling and experimentation by planning and conducting studies, anticipating patterns using probability and simulation, and employing statistical inference to analyze data and draw conclusions.

Course Estimated Completion Time: 2 segments/32-36 weeks

Major Topics and Concepts:

Segment I Concepts
Module 01: Exploring Data

- Introduction to Statistics
- Measures of Central Tendency
- Measures of Variation
- Displaying Data

Module 02: Collecting Data

- Sampling and Surveys
- Experiments
- Correlation Versus Causation

Module 03: Probability

- Basic Concepts of Probability
- Condition Probability and Two-Way Tables
- The Multiplication and Addition Rule
- Simulations

Segment II Concepts
Module 04: Probability Distributions

- Random Variables
- Binomial Probability Distribution
- Geometric Probability Distribution
- Introduction to Normal Probability Distribution

Module 05: Sampling Distribution

- Sampling Distributions and Proportions
- Sample Means
- Confidence Intervals for Proportions

- Confidence Intervals for Means

Module 06: Inference

- Hypothesis Testing- One Proportion
- Hypothesis Testing- One-Sample Mean
- Comparing Two Means
- Scatterplots and Correlation
- Least-Squares Regression