# MATH 260 Probability and Statistics

This course is an introduction to probability and statistics. It emphasizes on operations of sets, counting problems, definition of probability, conditional probability, Bayes' theorem, one- and two-dimensional random variables, mathematical expectation and variance, basic discrete and continuous probability distributions, moment generating functions, law of large numbers, and central limit theorem. It also includes aspects of descriptive statistics, statistical intervals, hypothesis testing and simple linear regression and correlation.

*(Pre-requisites: MATH 152 or MATH 154)*

## Course Learning Outcomes:

By the end of the course, students will be able to:

1. Demonstrate advanced knowledge and understanding of key concepts and theories of Probability and Statistics
2. Use computer-based tools in problem-solving covering a wide range of probability and statistics methods
3. Use a range of approaches to analyze and solve problems based on a probabilistic approach
4. Interpret and evaluate engineering and science applications, using numerical probability and statistical tools

## Textbook & Course Materials:

- Douglas C. Montgomery, George C. Runger, Applied Statistics and Probability for Engineers, 7th Edition, 2018.

## Course Content:

1. Descriptive Statistics
2. Probability
3. Discrete Random Variables & Probability Distributions
4. Continuous Random Variables & Probability Distributions
5. Joint Probability Distributions
6. Point Estimation of Parameters and Sampling Distributions
7. Statistical Intervals for a Single Sample
8. Hypothesis Testing Based on a Single Sample
9. Simple Linear Regression and correlation