## **MATH 260: Probability and Statistics (4 credits)**

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. ***(****Prerequisite****:*** *MATH 154****)***

**Course Learning Outcomes:**

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

A1. Demonstrate advanced knowledge and understanding of key concepts and theories of Probability and Statistics

A2 Use computer-based tools in problem-solving covering a wide range of probability and statistics methods

B1. Use a range of approaches to analyze and solve problems based on a probabilistic approach

B2. Interpret and evaluate engineering and science applications, using numerical probability and statistical tools

**Course Learning Materials:**

* Jay L. Devore, Probability and Statistics for Engineering and the Sciences, 9th Edition, Cengate 2016
* Mendenhall, Beaver and Beaver, Introduction to Probability and Statistics, Metric version 15th edition, cengate

**Course Content:**

1. Probability theory, including random variables and probability distributions.
2. Conditional probability and Bayes' theorem
3. Continuous and discrete probability distributions
4. Sampling distributions and statistical inference
5. Hypothesis testing and confidence intervals
6. Linear regression and correlation analysis
7. Applications of probability and statistics to various fields, including engineering, physics, and computer science.