Course Code	*Course Num.*	*Course Name*	*Credit Hours*	*Lec*	*Lab*	*Tut.*	*Pre-requisites*	*Course Level*
STA	**1215**	**Probability and Statistics for Engineers**	**5**	**4**	**0**	**2**	**MAT 1116**	**4**

Topics Outline

1. **Probability**. Sample Spaces and Events, Counting Sample Point, Interpretations and Axioms of Probability, Addition Rules, Conditional Probability, Multiplication and Total Probability, Independence, Bayes Theorem.
2. **Discrete Random Variables and Probability Distributions**. Probability Mass Functions, Cumulative Distribution Functions, Mean and Variance of a Discrete Random Variable, Binomial distribution, Hyper Geometric distribution, Poisson distribution.
3. **Continuous Random Variables and Probability Distributions**. Mean and Variance of Continuous Random Variable, Normal Distribution, Normal Approximation to the Binomial, Exponential Distribution.
4. **Point Estimation of Parameters and Sampling Distributions**: Point Estimation, Sampling Distributions and the Central Limit Theorem, General Concepts of Point Estimation: Unbiased Estimators, Variance of a Point Estimator, Standard Error, Mean Squared Error of an Estimator, Methods of Point Estimation: Method of Moments, Method of Maximum Likelihood.
5. **Statistical Intervals for single sample.** Confidence Interval on the Mean of a Normal Distribution (Variance Known), Confidence Interval on the Mean of a Normal Distribution (Variance Unknown), Confidence Interval on the Variance and Standard Deviation of a Normal Distribution, t Distribution, A Large-Sample Confidence Interval for a Population.
6. **Test for Hypotheses for a single sample.** Hypothesis Testing, One-Sided and Two-Sided Hypotheses, Tests on the Mean of a Normal Distribution (Variance Known), Tests on the Mean of a Normal Distribution (Variance Unknown), Tests on the Variance and Standard Deviation of a Normal Distribution, Large-Sample Tests on a Proportion.
7. **Simple Linear Regression and Correlation:** Introduction to Linear Regression, Least Squares and the Fitted Model, Hypothesis Tests in Simple Linear Regression, Correlation.

References:

1. ***Applied Statistics and Probability for Engineers,*** Sixth Edition, Douglas C. Montgomery and George C. Runger, John Wiley & Sons Inc., 2011, ISBN-13: 9780471745891.
2. ***Probability & Statistics for Engineers & Scientists,*** 8th Edition, R. Walpole, R. Myers, S. Myers, K. Ye, Pearson Education International, 2007.
3. ***Probability and Statistics in Engineering,*** 4th Edition, William W. Hines, Douglas C. Montgomery, David M. Goldsman, Connie M. Borror, John Wiley & Sons Inc, 2003.