

Introduction to Probability and Statistics

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
STA	1011	Introduction to Probability and Statistics	3	2	0	2	MAT 1114

Syllabus:

- 1. Descriptive Statistics:** Definitions, Need of Statistics & Statistical Problem-Solving Methodology & Introduction to Data Collection, Data Organization and Frequency Distributions, Graphic Presentations of Frequency Distributions, Computing Measures of Central Tendency, Computing Measures of Dispersion and Relative Position, Using Technology.
- 2. Probability:** Some Basic Considerations, Events, Counting Sample Point, Interpretations of Probability, Addition Rules, Conditional Probability, Multiplication and Total Probability Rules, Independence, Bayes' Theorem.
- 3. Random Variables and Probability Distribution:** Concept of Random Variable, Discrete Random Variables and Probability Distributions, Continuous Random Variables and Probability Distributions, Mean of Random Variable, Variance and Covariance of Random Variables, Means and Variances of Linear combinations of Random Variables.
- 4. Some Discrete Probability Distributions:** Bernoulli & Binomial Distribution, Hypergeometric Distribution, Geometric and Negative Binomial Distributions, Poisson Distribution.
- 5. Some Continuous Probability Distributions:** Continuous Uniform Distribution, Gamma and Exponential Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial.
- 6. Simple Linear Regression and Correlation:** Introduction to Linear Regression, The Simple Linear Regression Model, Least Squares and the Fitted Model.
- 7. Microsoft Excel software use:** Import data from text files and databases; Create a scatter plot with the Chart Wizard; Create tables of frequency, cumulative frequency, percentages, and cumulative percentages; Create histograms and break histograms down by groups; Generate random normal data; Create a normal probability plot, Fit a regression line and interpret the coefficients, Calculating Correlation Values.

References:

- 1. *Probability & Statistics for Engineers & Scientists*,** 8th Edition, R. Walpole, R. Myers, S. Myers, K. Ye, Pearson Education International, 2007.
- 2. *Introduction to Probability and Statistics*;** 14th Edition, W. Mendenhall, R. J. Beaver, Barbara M. Beaver, Duxbury Press, 2013..
- 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.
- 4. *Data Analysis with Microsoft Excel*,** 3rd Edition, Kenneth N. Berk, Patrick Carey, Duxbury Press, 2010.