AL IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING

Course Information	
Course Code, Number & Name	STAT215 Probability and Statistics in Engineering **Total Credit Hours: 3** (Theory Hours: 3 Tutorial: 1)
Prerequisite/s	MATH 106 Calculus II

Course Description

Basic course in Probability and Statistics: events, counting techniques, conditional probability, discrete and continuous random variables and probability distributions, random sampling and frequency distributions. Point estimation of parameters, hypothesis testing and statistical hypotheses.

Textbook	
Title	Probability and Statistics for Engineers and Scientists.
Author	Walpole, Myers and Ye
Publisher	Pearson

Course Contents

The Role of Statistics in Engineering: The Engineering method and statistical thinking: Collecting engineering, (basic principles, Retrospective study, Observational study and designed experiments);
Mechanistic and empirical models, Probability and probability Models.

Probability: Sample spaces and Events (Random experiments, random spaces, events); Counting techniques: Interpretations of probability (axioms of probability), additions rules; Conditional probability (Multiplication rule, total probability rule, independence, Bayes' theorem); Random variables.

Discrete Random Variables and Probability Distributions: Probability distributions and probability mass functions, cumulative distribution functions; Mean and variance of a discrete random variables.

Continuous Random Variables and Probability Distributions: Probability distributions and probability density functions, cumulative; distribution functions; Mean and variance of a continuous random variables; Normal distribution and normal approximation to the binomial and Poisson distributions; Examples of continuous distributions (exponential distribution, gamma distribution, Erlang distribution, Weibull distribution, lognormal distribution)

Joint Probability Distributions: Two discrete random variables:(Joint Probability distributions, Marginal probability distributions); Two discrete random variables, conditional probability distributions, independence); Linear combinations of random variables.

Random Sampling and Data Description: Data summary and display; Random sampling Steam and leaf diagrams, Frequency distributions and histograms, box plots, time sequence plots, probability plots.

Point Estimation of Parameters: General concepts of point estimation (Unbiased estimator, Variance of point estimator, mean square error of an estimator); Method of moments of point estimator
Method of maximum likelihood.

Tests of hypotheses: Hypotheses testing: statistical hypotheses, tests of statistical hypotheses, general procedure for hypotheses tests.

Academic Coordinator **Official Stamp**