Probability and Statistics

Code	Credit Hours
MATH-361	3-0

Course Description:

This course covers probability theory and various descriptive statistical techniques for collecting analyzing and interpreting data. The course also covers inferential statistics that includes sampling, estimation of parameters and testing of hypothesis.

Text Books:

1. Probability and Statistics for Engineers by Richard A. Johnson Calculus (6th Edition)
2. Advanced Engineering Mathematics by E. Kreyszig

Reference Books:

1. Introduction to Statistical Theory (Part I & II) by Prof Sher Muhammad Chaudhry & Dr. Shahid Kamal ((7th Edition)
2. Probability and Statistics for Engineers & Scientists, Seventh Edition by Walpole Myers
3. Probability and Statistics by Murray R. Speigel

Prerequisites:

None

ASSESSMENT SYSTEM

Quizzes	10-15 %
Assignments	5-10%
Mid Terms	25-35%
ESE	40-50%

Teaching Plan:

Week No	Topics	Learning Outcomes
1	Introduction	Course Outline, objectives, teaching plan, assessment method, Graphical Representation of Data: Stem-and-Leaf Plot, Histogram, Boxplot; Mean, Standard Deviation, Variance
2-4	Basic Probability	Sample Space, Experiment Outcomes, and Sampling with and without replacement, Set theory Introduction to theory of Probability, Theorems of Probability, Conditional probability, Permutations and Combinations
5-6	Random Variables and Probability Distributions	Random Variables and Probability Distributions Mean and Variance of a Distribution, Expectation, Moments
7-8	Some Probability Distributions	Binomial, Poisson & Hypergeometric distributions, Normal distribution, Distributions of several Random Variables
9	**Mid Semester Exam**	
10-12	Estimation	Random Sampling, Point estimation of Parameters, Confidence intervals
13-15	Hypothesis Testing	Testing of hypothesis, Decisions, Quality control, Control chart, Acceptance sampling, errors & rectification
16	Goodness of Fit	Goodness of Fit, Chi-square test
17	Regression Analysis	Regression Analysis
18	**End Semester Exam**	