

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. Advanced Engineering Mathematics (9th Edition) by Ervin Kreyszig.
2. Probability and Statistics for Engineers, Sixth Edition by Richard A. Johnson
Calculus (6th Edition) by Swokowski, Olinick and Pence.

Reference Books:

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

Prerequisites:

NA

ASSESSMENT SYSTEM

Quizzes	10%
Assignments	10%
Mid Terms	30%
ESE	50%

Teaching Plan:

Week No	Topics	Learning Outcomes
1	Introduction	Course Outline, objectives, teaching plan, assessment method, Introduction to statistics, Types of Data, Graphical Representation of Data, Stem-and-Leaf Plot, Histogram, Boxplot;
2-3	Measures of central, Non central Tendency , and Dispersion	Mean, Median, Mode, Quartiles, Deciles, Percentiles, Standard Deviation, Variance, coefficient of variation, Skewness and Kurtosis, Box Plot
4-6	Introduction to Probability	Sample Space, Experiment Outcomes, and Sampling with and without replacement, Set theory, Introduction to theory of Probability, Permutations and Combinations, Definitions of Probability, Theorems of Probability, Conditional probability, Bayes Rule, Reliability,
7-8	Random Variable	Random Variables and Probability Distributions, Mean and Variance of a Distribution, Joint Distributions Expectation, Moments,
9	Mid Semester Exam	
10-13	Distributions	Binomial, Geometric, Poisson & Hypergeometric distributions Normal, Uniform and Exponential distribution,
14-16	Sampling, Estimation, and Testing of Hypothesis	Random Sampling, sampling Distributions, Point estimation of Parameters , Confidence intervals, Testing of hypothesis. Decisions, Goodness of Fit, Chi-square test, sampling errors
17	Regression, Quality control	Linear Regression, Multiple Regression and Correlation,, Control chart
18	End Semester Exam	