Probability and Statistics

Course Code	Credit Hours
MATH-361	3-0

Course Description

The course offers the basic understanding of Statistics and Probability. This course covers the use of statistical analysis in civil engineering problems and gives a detailed review of descriptive statistics and probability, detailed study of important distributions such as binomial, exponential, Poisson, normal distributions etc. and their applications in civil engineering.

Text Book:

1. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross.

Reference Book:

1. Calculus with Analytic Geometry by Thomas and Finny.
2. Probability and Statistics by Murray R.Spiegel, John J.Schiller, A.V.Srinivasan, Mike Levan.

Prerequisites :

Calculus and Analytical Geometry**.**

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/Learning Outcomes
1	Introduction to descriptive and inferential statistics, measurement of scales, Collection of data, Classification, Distribution, Graphical representation.
2	Histograms, frequency polygons, types of frequency curves, Cumulative

	frequencies, Relative Frequencies.
3	Histograms for the unequal class widths, Measure of central tendency, Arithmetic mean, Geometric mean, Harmonic mean, relation between A.M, G.M and H.M.
4	Median, quartiles, deciles, percentiles, mode. Root mean square, Relation between mean median and the mode, Merits and Demerits of averages.
5 -6	Measure of Variability, variance, standard deviation, coefficient of variation, range; inter quartile range, coefficient of Quartile deviation, Mean deviation, Coefficient of mean deviation, moments, skewness, and kurtosis.
7	Introduction to probability, review of set theory, sample space, events, axioms of probability.
7	Permutation and combination, conditional probability, dependent and independent events
8	Distribution function, discrete random variable and its probability distribution.
9	**Mid Semester Exam**
10	Continuous random variable and its probability density function.
11-12	Mathematical expectation of a random variable, moment generating functions
13	Binomial distribution and its applications, Poisson distribution and its application.
14	Uniform, exponential and normal distributions
15-16	Binomial distribution approximation to Normal distribution Student-t test, Z-test, Testing of hypothesis
17-18	**End Semester Exam**

Practical: Nil