

Course Number and Title:	NS-314 Probability and Statistics for Engineers		
Credit Hours:	3		
Pre Requisite	Nil		
Instructor (s):	Mr. Waqas Arshad		
Lab Engineer:	Nil		
Compulsory/Elective:	Compulsory		
If Elective:Depth Core/Breadth Core:	N/A		
Course Schedule:	Lecture:	3 hours/week	
	Lab:	0 hours/week	
	Office hours:	3 hours/week	
Course Assessment:	Assignments:	3	
	Quizzes:	3	
	Course project:	0	
	Lab work:	Nil	
	Exams:	Mid-semester and Final	
Grading Policy:	Quizzes:	10%	
	Assignments/Course Project:	10%	
	Lab work:	0%	
	Mid-Semester:	20%	
	End-Semester:	60%	
Text Book:	Ronald E. Walpole, Raymond H, Myers and Sharon L. Myers and Keying Ye, Probability and Statistics for Engineers and Scientists, Prentice Hall		
Reference Book(s):	Susan Milton and Jesse C. Arnold, Introduction to Probability and Statistics: Principles and Application for Engineering and the Computing Sciences, McGraw Hill. William Mendenhall and Terry Sincich, Statistics for Engineer and Sciences, Prentice Hall Decoursey W., Statistics and Probability for Engineering Applications, Newness Soong T. F., Fundamentals of Probability and Statistics for Engineers, John Wiley and Sons.		
Course Objective:	To introduce the basic concepts and engineering applications of probability and statistics.		
Course Learning Outcome	CLO Statement	PLO	Bloom
CLO-1:	Understand the basic concept of Statistics probability and their need in engineering	PLO-1	C1
CLO-2:	Application of Probability and Statistics for understanding and analysis of different electrical engineering problems	PLO-2	C3
Topics covered in the course and level of coverage:	❖ Basic Statistics and Set Theory	3 hours	
	❖ Measure of Central Tendency	3 hours	
	❖ Measure of Dispersion	3 hours	
	❖ Moments and Moment generating Function	3 hours	
	❖ Curve Fitting and Simple Regression, Limit Theorem	6 hours	
	❖ Probability, Conditional Probability, Independent Events and Baye's Theorem	6 hours	
	❖ Discrete and Continuous Random Variable and Probability Distribution functions	6 hours	
❖ Probability Distribution (Uniform, Binomial, Hypergeometric,	15 hours		

	Poisson, Normal and Exponential)		
	❖ Stochastic Process, first and second Order characteristics		3 hours
	❖		
Program learning outcomes and how they are covered by specific course outcomes:	Detailed Contents	CLO	PLO
	Basic Statistics and Set Theory Statistics, Branches of Statistics, Primary Data, Secondary data, Population, Statistic, Set Theory, Universal Set, Union of Set, Intersection of Sets, Demorgan Law, Associative Law, Distributive Law.	CLO-1	PLO-1
	Measure of Central Tendency Construction of frequency distribution, Arithmetic mean, Median, Mode, Harmonic Mean, Geometric Mean, applications, Merits, Demerits,	CLO-1	PLO-1
	Measure of Dispersion Variance, Properties of Variance, Application of Variance, Standard Deviation, Properties of standard deviation, application of Standard	CLO-1	PLO-1
	Moments and Moment Generating Function Moments about mean, moments about arbitrary value, moment about change of origin and scale, relationship between raw moment and moment about mean.	CLO-1	PLO-1
	Curve fitting, Simple regression and Limit Theorem Bar graph, Histogram, Multiple Bar graph, Pictogram, Dot plot, Cumulative frequency Polygon, Box and Whisker Plot. Scatter diagram, Simple regression line, Estimation of regression coefficient, Properties of regression line. Central Limit Theorem	CLO-1	PLO-1
	Probability, Conditional Probability and Baye's Rule Permutation, Combination, Probability, Experiment, Random Experiment, Events, Types of Events, Sample Space, Null space, Mutually Exclusive events, Exhaustive events, Conditional Probability, Independent Events, Law of Total Probability, Baye's Rule.	CLO-2	PLO-2
	Discrete and Continuous Random Variable and Probability Distribution Functions Random Variable, Discrete Random Variable, Continuous Random Variable, Discrete Probability Distribution, Continuous probability distribution, Probability Distribution function, application.	CLO-1	PLO-2
	Probability Distribution (Uniform, Binomial, Hypergeometric, Poisson, Normal and Exponential) Derivation of Probability Distributions, Mean, Median, Mode, Variance, Moment Generating Function, and their applications.	CLO-2	PLO-2
	Stochastic Process and First and Second Order Characteristics Stochastic process, Markov chain, Stationary Process, Random filed, Continuous Markov chain, Markov Process.	CLO-1	PLO-1

Mapping of CLOs with PLOs and Bloom's Taxonomy Cognitive Levels:												
PLO	1	2	3	4	5	6	7	8	9	10	11	12
CLO-1	C1											
CLO-2		C3										
Mapping of CLOs with Assessment Methods:												
CLOs/Assessment	CLO-1			CLO-2								
Quizzes:	√			√								
Mid-Semester:	√			√								
End-Semester:	√			√								