SILVER OAK UNIVERSITY

Engineering and Technology
Bachelor of Engineering
Subject Name: Probability, Statistics and Numerical Analysis
Subject Code: 1010273201
Branch: CE/IT

Prerequisite: Calculus, Algebra

Objective: Understand different methods of solution of the equations and compare them. Student will be made aware of different numerical and statistical methods which are used in engineering field, with emphasis on how to prepare program for different methods. The concepts of probability distributions and sampling theory for large and small samples.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Evaluation Scheme				Total Marks
L	T	P	C	Internal		External		
				Th	Pr	Th	Pr	
3	2	0	5	40	--	60	--	100

Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1	Probability: Baye's Theorem, Random Variables:- discrete & continuous random variables, expectation, Variance, Probability Density Function & Cumulative Density Function, Moments, Moment Generating Function., Probability distribution: binomial distribution, Poisson & normal distribution.	06	15%
2	Sampling theory: Test of Hypothesis, Level of significance, Critical region, One Tailed and two Tailed test, Test of significant for Large Samples:- Means of the samples and test of significant of means of two large samples, Test of significant of small samples:- Students t-distribution for dependent and independent samples, Chi square test:- Test of goodness of fit and independence of attributes, Contingency table	08	18%
3	Statistics: Measures of central tendency, Standard deviation, Coefficient of variation, Moments, Skewness and Kurtosis, Karl Parson's coefficient Curve fitting: least square approximation, fitting of linear curve, quadratic curve and non-linear curve	10	22%
4	Correlation and Regression: correlation and its properties, types of correlation, correlation coefficient, rank correlation, regression, regression coefficient, properties and expressions of regression coefficient	06	15%

5	Solution of Algebraic and Transcendental equations: Bisection method, Fixed point iteration method, Newton Raphson method, Regula falsi method, Secant method (without flowchart and algorithm), Numerical solution of ordinary differential equation of first order Euler method and Runge Kutta Method (without flowchart and algorithm), Numerical Integration, Trapezoidal Rule and Simpson Rule (without flowchart and algorithm)	12	30%

Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	Understand the concepts of probability and expectation for getting the spread of the data and distribution of probabilities.	1
CO-2	Apply the concept of probability distribution to engineering problems & testing hypothesis of small samples using sampling theory.	2
CO-3	Observe the measures of central theory and find unknown variables using curve fitting	3
CO-4	Apply statistical methods like correlation, regression analysis	4
CO-5	To study Numerical method and its Algorithm	5

Teaching & Learning Methodology:-

(i) Focus on tricks of the trade and intuitive idea of Concept; use the main theorems as tools, no compromise on rig our, illustrative exercises under each topic, view point of applications
(ii) Tutorial and Teacher guided Problem solving based pedagogy
(iii) Topic based seminars, Internet based assignments, and teacher guided self-learning activities

List of Experiments/Tutorials: Unit wise/Topic wise Tutorials/Teacher Guided Problem Solving Sets are to be given for Practice and better understanding of Concepts and applications

Major Equipment: NIL

Books Recommended:-

1. Probability and Statistics for Engineering, Dr. J Ravichandran, Wiley-India.
2. Operation Research by Hira & Gupta,S Chand.
3. Grewal B.S, Higher Engineering Mathematics "40th edition", Khanna publishers, New-Delhi (2007).
4. Erwin Kreyszing "Advanced Engineering mathematics", 10th edition-Wiley India.
5. Sheldon Ross, A First Course in Probability, Prentice Hall
6. S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons.
7. T. Veerarajan, "Probability, Statistics and Random Processes", McGraw-Hill Education
8. S A Mollah, Numerical analysis and computation procedures, Books and allied (P)Ltd

List of Open Source Software/learning website:

1. https://www.nptel.ac.in/
2. https://swayam.gov.in
3. https://www.coursera.org