PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Applied Science & Humanities

SYLLABUS FOR 4th Sem BTech PROGRAMME

Probability, Statistics and Numerical Methods (203191251)

Type of Course: BTech

Prerequisite:

Rationale:

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/	Tut Hrs/	Lab Hrs/		T	P	T	CE	P	
3	2	0	5	60	-	20	20	-	100

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Unit 1**: **Correlation, Regression and Curve Fitting :** Correlation and Regression – Rank correlation Curve Fitting by The Method of Least Squares- Fitting of Straight Lines, Second Degree Parabolas and More General Curves	18%	8
2	**Unit 2**: **Probability and Probability Distributions:** Probability Spaces, Conditional Probability, Bayes' Rule, Discrete and Continuous Random Variables, Independent Random Variables, Expectation and Variance of Discrete and Continuous Random Variables, Distribution and Their Properties: Binomial Distribution, Poisson Distribution, Normal Distribution	23%	10
3	**Unit 3**: **Testing of Hypothesis:** Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations. Test for single mean, difference of means, Test for ratio of variances, Chi-square test for goodness of fit and independence of attributes.	26%	12

4	**Unit 4**: **Solution of a System of Linear Equations, Roots of Algebraic and Transcendental Equations:** Gauss-Jacobi and Gauss Seidel Methods, Solution of Polynomial and Transcendental Equations – Bisection Method, Newton-Raphson Method and Regula-Falsi Method	11%	5
5	**Unit 5**: **Finite Differences and Interpolation:** Finite Differences, Relation between Operators, Interpolation using Newton's Forward and Backward Difference Formulae. Newton's Divided and Lagrange's Formulae for Unequal Intervals.	11%	5
6	**Unit 6**: **Numerical Integration:** Trapezoidal rule, Simpson's 1/3rd and 3/8thRules, Gaussian Quadrature Formulae. **Numerical solution of Ordinary Differential Equations:** Taylor's Series, Euler and Modified Euler's Methods. Runge- Kutta Method of Fourth Order for Solving First and Second Order Equations.	11%	5

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Numerical Methods in Engineering & Science with Programs in C and C++ (TextBook)
Dr. B. S. Grewal; Khanna Publishers

Course Outcome:

After Learning the course the students shall be able to:

After learning the course the students will be able to:
1. Understand the Importance of numerical method in real world problem where analytic methods fails.
2. Formulate and solve problems involving random variables.
3. Apply statistical methods for analyzing experimental data.