



Kadi Sarva Vishwavidyalaya
Faculty of Engineering & Technology
Second Year Bachelor of Engineering (CE/IT) – Semester IV
(With effect from: Academic Year 2018-19)

Subject Code: CC402B-N	Subject Title: Probability, Statistics and Numerical Methods
Pre-requisite	

Teaching scheme				Total Credit	Evaluation Scheme					Total
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	
Hours	Hours	Hours	Hours		Hours	Marks	Marks	Marks	Marks	
03	01	02	06	05	03	70	30	20	30	150

Course Objective:

The main objective of this course is to provide students with the foundations of numerically, probabilistic and statistical analysis mostly used in varied applications in engineering and science like disease modeling, climate prediction and computer networks etc.

Outline Of the Course:

Sr. No	Title of the Unit	Minimum Hours
1	Probability Axioms	9
2	Discrete Random Variables	7
3	Continuous Random Variables	7
4	Correlation and Regression	7
5	Interpolation	8
6	Numerical Integration	4
7	Solution of non-linear and Linear equation	6
		48

Total hours (Theory): 48

Total hours (Tutorial): 16

Total hours (Lab): 32

Total hours: 96

Detailed Syllabus

Sr. No	Topic	Lecture Hours	Weight age(%)
1	Probability Axioms: Introduction of Basic counting techniques-inclusion and exclusion, Permutations and Combinations, Axiomatic Definitions, Conditional probability, Baye's theorem	9	15%
2	Discrete Random Variables: Random variables, Discrete Random Variables, Expected Value, Expectation of a Function of a Random Variable, Variance, Binomial Distribution, Poison Distribution.	7	15%
3	Continuous Random Variables: Introduction, Expectation and Variance of Continuous Random Variables, The Uniform Random Variable, Normal Random Variables.	7	15%
4	Correlation and Regression: Mean, median, variance, standard deviation, Correlation, Linear Regression and logistic Regression.	7	15%
5	Interpolation: Relation between operators, Interpolation using Newton's forward and backward difference formulae, central difference formulae. Interpolation with unequal intervals: Newton's divided difference and Lagrange's formulae.	8	20%
6	Numerical Integration: Newton cotes Formula, Trapizoidal Formula, Simpson's 1/3 , 3/8 formula, Weddles formula, Gaussian Quadrature Formula.	4	8%
7	Solution of non-linear and Linear equation: Solution of a nonlinear equation: Bisection method, Regula False Method and Secant methods, Newton's method, rate of convergence, Gauss-Seidel methods, Gauss Jacobian method.	6	12%
Total		48	100%

Instructional Method and Pedagogy:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- In Tutorial, class will be divide into two subclasses & faculties will solve or assign the problem of the subject in each subclass.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

Learning Outcome:

- After completion of that subject students will be able to apply statistical and numerical methods in various computer science related projects and research.

Text/Reference Books

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).
3. S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.
4. W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.
5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
6. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
7. Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, NewDelhi, 2010.
8. V Rajaraman., Computer Oriented Numerical Methods - PHI.
9. C. E. Froberg, Introduction to Numerical Analysis (2nd Edition), Addison-Wesley
10. 10. P. Kandasamy, K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2nd Edition, Reprint 2012.
11. S.C. Gupta, V.K. Kapoor, Fundamental of Mathematical Statistics, Sultan Chand & Sons, Educational Publishers, New Delhi.

List of Tutorials:

Sr. No.	Tutorial Content
1	Problem solving on “ Probability Axioms ”
2	Problem solving on “ Discrete Random Variables ”.
3	Problem solving on “ Continuous Random Variables ”.
4	Problem solving on “ Correlation and Regression ”.
5	Problem solving on “ Interpolation ”
6	Problem solving on “ Numerical Integration ”.
7	Problem solving on “ Solution of non-linear and Linear equation: ”.

List of experiments:

Sr. No.	Name of Experiment
1	Implement Bisection Method
2	Implement False position Method
3	Implement Secant Method
4	Implement Newton Raphson Method
5	Implement Trapezoidal Method
6	Implement Simpson's 1/3rd Method
7	Implement Simpson's 3/8th Method
8	Implement Gauss Elimination Method
9	Implement Gauss Seidal Method
10	Implement Newton's Forward interpolation
11	Implement Newton's Backword interpolation