

B.Sc. Computer Science – 2023-2024

Numerical Methods – I

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	NUMERICAL METHODS-I	Elective	4	-	-	-	3	4	25	75	100
Learning Objective											
LO1	To solve practical technical problems using various numerical method formulas										
LO2	To derive appropriate numerical methods to solve algebraic, transcendental equations.										
LO3	To know the numerical methods of solving simultaneous linear equations.										
LO4	To acquire knowledge about forward differences and Backward differences and their relationship.										
LO5	Knowledge about central difference operators and problems based on various central differences formulae.										
UNIT	Contents										No. of Hours
I	Curve Fitting- Principle of Least square Fitting of straight line $Y = ax + b$, parabola $Y = ax^2 + bx + c$, exponential curves of forms $Y = ax^b$, $Y = ae^{bx}$, and $Y = ab^x$.										12
II	The solution of numerical algebraic and transcendental Equations: Bisection method – Iteration Method – Regula Falsi Method – Newton – Raphson method										12
III	Solution of simultaneous linear algebraic equations: Gauss elimination method – Gauss Jordan method – Method of Triangularization – Gauss Jacobi method – Gauss Seidel method										12
IV	Finite differences Operators Δ, ∇ and E - relation between them — factorial polynomials. Interpolation with equal intervals: Gregory-Newton forward and backward										12

	interpolation formulas.	
V	Central differences formulae Operators μ , δ and relation with the other operators. Gauss forward and backward formulae, Stirling's formula and Bessel's formula	12
	Total	60

Course Outcomes		Programme Outcome
CO	Upon completion of the course the students would be Able to:	
1	Solve the problems of fitting of straight lines, parabolas and the different form of exponential curves	PO1
2	Solve algebraic equations using various methods like Bisection method, Iteration method, Regula Falsi method and Newton – Raphson method	PO1, PO2
3	Estimate the solution of simultaneous linear equations using different numerical methods	PO3, PO5
4	Define basic concept of operators Δ , ∇ and E , Solving interpolation with equal intervals problems using Gregory Newton's forward formula and Newton's backward formula	PO5
5	Estimate the solution of central difference formula using the methods Gauss's forward, backward formula, Stirling's formula and Bessel's formula	PO3, PO6

Text Book

Kandasamy. P, Thilagavathi. K and Gunavathi. K "Numerical methods" – S. Chand and Company Ltd, New Delhi – Revised Edition 2007. (Chapters: 1,3,4,5,6, and 7).

Reference Books

Venkataraman M. K., "Numerical Methods in Science and Engineering" National Publishing company V Edition 1999.

Sankara Rao K., "Numerical Methods for Scientists and Engineers" 2nd Edition Prentice Hall India 2004

Web Resources

<https://nptel.ac.in/courses/111107105>

Mapping with Programme Outcomes:

CO/PSO	PSO1	PSO 2	PSO3	PSO4	PSO 5	PSO6
CO 1	3	3	3	3	3	3
CO 2	3	3	2	3	3	3
CO 3	3	2	2	3	2	3
CO 4	3	3	3	2	2	3
CO 5	3	2	3	2	3	2
Weight age of course contributed to each PSO	15	13	13	13	13	14

S-Strong-3 M-Medium-2L-Low-1

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Discrete Mathematics-I

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	DISCRETE MATHEMATICS-I	Core	4	-	-	-	3	4	25	75	100
Learning Objective											
LO1	To make the students understand the Mathematical Logic and truth table.										
LO2	To know about how and when to use set theory.										
LO3	To understand the discrete structure, storage structure.										
LO4	To understand the methods of Relations and ordering.										
LO5	To understand the functions, classifications, and types.										
UNIT	Contents									No. of Hours	
I	Mathematical logic-: Connectives, well formed formulas, Tautology, Equivalence of formulas, Tautological implications, Duality law, Normal forms.									12	
II	Set Theory: Basic Concept of Set Theory – Operations on Sets – Venn Diagram									12	
III	Representation of Discrete Structure : Data Structure – Storage Structure - Sequential Allocation – Pointers and Linked Allocation – An Application of Bit Represented Sets.									12	
IV	Relations and Ordering: Relations – Properties of Binary Relations in a set – Relation Matrix and the Graph of a Relation – Partition and Covering of a set – Equivalence Relations – Compatibility Relations – Composition of Binary Relations –Partial Ordering – Partially Ordered set.									12	

V	Functions Definitions of functions and its Classification – Types – Examples – Composition of functions – Inverse functions – Binary and n-ary operations – Characteristic function of a set – Hashing functions – Recursive functions	12
	Total	60

Course Outcomes		Programme Outcome
CO	Solve problems in Mathematical logic and truth table.	
1	Know and understand about set theory.	PO1, PO6
2	Know and understand about discrete structure, storage structure.	PO2
3	Know and understand about Relations and Ordering	PO4, PO5
4	Understand the functions, classification and types.	PO6

Text Book

Discrete Mathematical Structures with applications to computer Science J.P Tremblay and R.P Manohar (Mc.Graw Hill, 1997.)

Reference Books

P.R. Vittal, Mathematical Foundations– Margham Publication, Chennai.

Discrete Mathematics-Oscar Levin(3rd Edition)

Web Resources

<https://nptel.ac.in/courses/106106094>

<https://nptel.ac.in/courses/111107058>

Mapping with Programme Outcomes:

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO 1	3	3	3	3	3	3
CO 2	3	2	3	3	2	3
CO 3	3	3	3	3	3	3
CO 4	3	2	2	3	3	3
CO 5	3	2	3	3	3	2
Weight age of course contributed to each PSO	15	12	14	15	14	14

S-Strong-3 M-Medium-2 L-Low-1