AC –11-03-25
Item No. – 04

Approved by the BoS in Information Technology on 03-03-2025 Item No. 04

As per NEP 2020

Tolani College of Commerce (Autonomous)

Knowledge is Supreme

Title of the Course: Discrete Mathematics

Syllabus for Four credit Course - From the academic year- 2025-2026

Name of the Course: Mathematics Minor-Semester IV

Programmes:

Bachelor of Management Studies
Bachelor of Commerce (Accounting & Finance)
Bachelor of Commerce (Banking & Insurance)
Bachelor of Commerce (Financial Markets,
Bachelor of Science (Information Technology)

Sr. No.	Heading	Particulars
1	**Description the course:**	Discrete Mathematics is a branch of mathematics dealing with distinct and separate values, often used in computer science and logic. It covers topics like set theory, logic, combinatorics, graph theory, and number theory. The course focuses on mathematical reasoning, problem-solving, and proof techniques. It is essential for understanding algorithms, data structures, and cryptography. Applications include network design, optimization, and artificial intelligence.
2	**Vertical :**	Minor
3	**Type:**	Theory / Practical
4	**Credit**:	4 credits (2 credit = 30 Hours for Theory and 30 Hours of Practical work in a semester)
5	**Hours Allotted :**	60 Hours
6	**Marks Allotted**:	100 Marks (60 (SE) + 40 (CE))

7	**Course Objectives**: 1. Develop Mathematical Reasoning – Enhance logical thinking and problem-solving skills through formal proofs and arguments. 2. Understand Fundamental Structures – Learn key concepts such as sets, relations, functions, graphs, and trees. 3. Apply Combinatorial Techniques – Solve counting problems, analyze permutations, combinations, and recurrence relations. 4. Explore Algorithmic Applications – Use discrete mathematics in computer science, including algorithms, cryptography, and optimization	
8	**Course Outcomes**: 1. Understand and apply mathematical logic, set theory, and proof strategies 2. Develop problem-solving skills and reasoning techniques necessary for rigorous mathematical arguments. 3. Apply fundamental counting principles, permutations, combinations, and binomial theorems. 4.Solve problems related to discrete probability, pigeonhole principle, and inclusion-exclusion principle.	
9	**Modules**:-	
	Module 1: Sets (15 Hours) ● Sets and Subsets ● Operations on sets ● Sequences , Properties of integers ● Mathematical Structures	
	Module 2. Logic (15 Hours) ● Propositions and logical Operations ● Conditional Statements ● Mathematical Induction ● Mathematical Statements, Logic and problem solving	
	Module 3: Counting (15 Hours) ● Permutations and Combinations ● Pigeonhole Principle ● Recurrence Relations	
	Module 4. Relations and Digraphs(15 Hours) ● Product set and Partitions ● Relations and Digraphs ● Properties of Relations, Equivalence relations ● Operations on relations	
10	**Reference Books** 1. Discrete Mathematics and Graph Theory" – Bhavanari Satyanarayana & Kuncham Syam Prasad 2. Discrete Mathematics" – Rajendra Akerkar & Rupali Akerkar 3. Discrete Mathematical Structures" – G. Shankar Rao 4. Discrete Mathematics and Its Applications" – T. Veerarajan	
11	**Internal Continuous Assessment: 40%**	**Semester End Examination : 60%**
12	**Continuous Evaluation through:**	Assignment /Periodical Test
13	**Format of Question Paper:** for the final examination Q. 1 Attempt any Three (15 marks) a.	

	b. c. d. Q. 2 Attempt any Three (15 marks) a. b. c. d. Q. 3 Attempt any Three (15 marks) a. b. c. d. Q. 4 Attempt any Three (15 marks) a. b. c. d.

Signatures of Team members

Sr. No.	Name	Signature
1	Ms. Shubha Chaubal	
2	Ms. Priyanka Malvankar	