

## **GANPAT UNIVERSITY**

FACULTY OF COMPUTER APPLICATIONS										
Programme	B. S	Sc. IT (Ho	ons.)			Branch/Spec.	Compute	Computer Applications		
Semester	III					Version	1.0.0.0	1.0.0.0		
<b>Effective from Academic Year</b> 2025-26						Effective for the batch Admitted in June 2				
<b>Subject Code</b>	U23	U23C4FMI Subject Name				Fundamental Mathematics for IT				
	To	eaching so	cheme			Examination scheme (Marks)				
(Per week)	Lecture (DT)		Practica	etical (Lab.) Tot			CE	SEE	Total	
	L	TU	P	TW						
Credit	4	-	-	-	4	Theory	50	50	100	
Hours	4	-	-	-	4					

## **Objective:**

Students can improve mathematics knowledge. It enhance the logic of the students.

## Pre-requisites:

Require the basic knowledge of mathematics.

## **Course Outcomes:**

Name	of CO	Description										
CO1		Improve knowledge in set theory and solve the problems of different sets as well symmetric										
		solution and cardinality of sets.										
CO2 Improve knowledge in permutation and combination formula as well counting p							principles to					
		solve the problems.										
CO3	Graph theory is the study of graphs and trees which are mathematical structures used to n							sed to model				
	pairwise relations between objects.											
CO4	Matrix is a rectangular array of numbers, symbols, or expressions to solve. Matrix						trix improve					
		arrange	arranged in rows and columns to solve different problems for future aspect									
		Mapping of CO and PO										
Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	2	3	2	1	3	0	1	0
CO2	3	3	2	2	2	3	2	1	3	0	1	0
CO3	3	2	1	3	3	3	3	3	3	1	0	1
CO4	3	3	1	2	2	3	3	3	3	1	0	1

Theo	ry syllabus	
Unit	Content	Hrs
1	Set Theory Introduction, Representation of Sets and Elements, Universal Set and Empty Set, Subsets, Equality of two sets, Equivalent sets, Power set, Disjoint set, Venn Diagrams, Set Operations: Union, Intersection, Difference, Symmetric difference, Compliment of a set, Cartesian product of two sets, Algebra laws of Set theory, Finite set, Infinite set and counting principle, Examples related to cardinality of sets.	15
2	Counting Introduction-Basic Counting Principles, Factorial Notation, Binomial Coefficients, Permutations, Combinations, The Pigeonhole Principle, Ordered and Unordered Partitions	10
3	Graph Theory Introduction, Konigsberg bridge problem, Data Structures, Graphs and Multigraphs, sub graphs, Finite graphs, Trivial Graph, Isomorphic and Homeomorphic Graphs, Paths Connectivity, Complete, Bipartite Graphs, Trees, Basics of tree in data structure.	20
4	Vectors and Metrics Introduction, Vectors Matrices, Unit matrix, Square matrix, Transpose of a Matrix, Invertible(Non-singular) Matrices, Zero matrix or Null Matrix, Row Matrix and Column Matrix, Symmetric Matrix, Skew Symmetric Matrix, Upper Triangular Matrix, Lower Triangular Matrix, Arithmetic Operations on Matrices: Addition, Subtraction and Multiplication of Matrices, Determinants, Elementary Row Operations, Gaussian Elimination	15
Pract	ical Content:	
N.A.		
Text	Books:	
1	Discrete Mathematics:- Seymour Lipschutz and Marc Lars Lipson Adapted By: Varsha H. Patil	
Refe	rence Books:	
1	Advance Mathematics:- Heena Timani- Books India Publication	
2	Discrete Mathematics:- Babu Ram- Pearson Publication.	
Web	References / MOOC / Certification Course	
1	https://nptel.ac.in/courses/111/107/111107058/	
2	https://www.coursera.org/lecture/mathematics-for-economists/1-2-operations-on-sets-HZ3aF	
Ques	tion Paper Scheme:	
	University Examination Duration: 2 Hours  Note for Examiner: Q-1 Must be common from any topics from the syllabus. Q-2 And onwards must be from specific topics and internal choice or option can be given.  Paper Structure: Q-1 Must be from all Unit Any Five out of seven (25 Marks) [CO1, CO2, CO3, CO4] Q-2 Must be from Unit 1: Any Two out of Three (06 Marks) [CO1] Q-3 Must be from Unit 2: Only one question without any option (05 Marks) [CO2] Q-4 Must be from Unit 3: Any Two out of Three (08 Marks) [CO3] Q-5 Must be from Unit 4: Any Two out of Three (06 Marks) [CO4]	