UG Add on Course Academic year:2022-2023

Course Title: Discrete Mathematics **Total Hours :** 30 Hours	**Department:** Mathematics **Credit:** 2	
CoursePre-requisites/ Co-requisites	Basic Mathematics & Knowledge in Analytical	
Objectives:	1. To give an introductory knowledge of the basics abstract systems of mathematics. 2. To train the students to generalize the known concepts. 3. To translate situations to diagrammatic representations and to develop problem solving skills. 4. To familiarize the students with the basic concepts, results, methods, vocabulary and notation associated with Discrete Mathematics.	
ExpectedLearning Outcome:	On completion of the course, students will have the ability to 1. Explain the theory behind relations and functions and how functions may relate dissimilar structures to each other. 2. Be aware of a class of functions which transform a finite set in to another finite set which relates to input and output function computer science. 3. Have knowledge of the concepts needed to test the logic of a program. 4. Understand logic and mathematical reasoning to count or enumerate objects in a systematic way.	
Module- 1	**Set Theory**	**6Hours**
Sets-Introduction to Sets, The Cartesian Product, Subsets, Power Sets, Union, Intersection, Difference, Complement, Venn Diagrams.		
Module- 2	**Relations and Function**	**6Hours**
Introduction to Relations, Type of Relations- universal relation, identity relation, inverse relation, equivalence relation -Function-Basic definitions, Injective, Surjective, Bijective.		
Module- 3	**Logic and Proofs**	**6Hours**
Propositional Logic- Propositional equivalences-Predicates and Quantifiers-Nested Quantifiers-Rules of inference- Introduction to proofs-Proof methods and strategy.		
Module -4	**Combinatorics**	**6Hours**
Mathematical induction – Strong induction and well ordering – The basic of counting-The pigeonhole principle-Permutations and combinations – Recurrence relations-Solving linear recurrence relations-Generating functions-Inclusion and exclusion principle and its applications.		

Module -5	**Graph Theory**	**6Hours**
Graph and graph models-Graph terminology and special types of graphs – Representing graphs and graph isomorphism-Connectivity –Euler and Hamilton paths		
Text Books 1. Kenneth H. Rosen, Discrete Mathematics and its Applications, 7th Edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2012 2. A Text Book Of Set Theory by Manoranjan Kr.Singh 2020th edition (1 January 2020). 3. Arumugam S. and Thangapandi Isaac A - Modern Algebra, Scitech Publications (India) PVT Ltd Chennai Edition 2003.		
References 1. Bhattacharya P.B., Jain S.K., Nagpaul S.R., Basic Abstract Algebra, Second Edition, Cambridge University Press. 2. Seymour Lipschutz, Marc Lars Lipson, Discrete Mathematics, Tata McGraw Hill, NewDelhi. 3. Ralph.P.Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi(2002). 4. Parthasarathy K.R., Basic Graph Theory, Tata McGraw Hill Publishing Company Limited, New Delhi.		
Mode of Evaluation	**Practice Tests-40%,Continuous Assessment Tests-60%,** Assessment Test 1 -20% Assessment Test 2 -20% Assessment Test 3 -20%	
Course Coordinator	Dr.Mrs.P.Shanthi	
Course Instructor	Dr.Mrs.A.Sudha	