Indraprastha College for Women
University of Delhi

Course Name:	B.Sc.(H) Mathematics
Paper Title:	Discrete Mathematics
Unique Paper Code:	2352012303
Semester:	III
Faculty(s):	Dr. Pardeep Kumar
Year:	2024

Work Plan

Period	Unit No.	Learning Objective	Topics to be Covered
1st Aug -3rd Aug	1	Set and Function	Review of Set Theory Language of Mathematics Reviews of Functions
5th Aug-10th Aug	1	Boundedness And Isomorphism	Revies of boundedness Definitions, examples and basic properties of partially ordered sets Order-isomorphisms and Homo.
12th Aug-17th Aug	1	Graph	Covering relations, Hasse diagrams. Dual of an ordered set Duality principle.
19th Aug-24th Aug	1	Maximality	Bottom and top elements, Maximal and minimal elements Zorn's lemma and its uses.
26th Aug-	1	Ordering	Building ordered set.

31st Aug			Maps between ordered sets. Covered Set and Theorem
2nd Sep-7th Sep	2	Logics and Lattice	Reviews of logics Lattices as ordered sets, Lattices as algebraic structures
9th Sep-14th Sep	2	Lattice	Sublattices and their related articles Products of Lattice
16th Sep-21st Sep	2	Properties of Latties	Lattice isomorphism. Definitions, examples and properties of modular and distributive lattices.
23rd Sep-28th Sep	2-3	M-N Concept	M3 – N5 theorem with applications
30th Sep-5th Oct	3	Properties of Lattice	Complemented lattice. Complemented lattice. Relatively complemented lattice.
7th Oct-12th Oct	3	Properties of Lattice	Relatively complemented lattice. Relatively complemented lattice. Sectionally complemented lattice.
14th Oct-19th Oct	3	Properties of Lattice	Sectionally complemented lattice. Complement on Product Lattice.
21st Oct-26th Oct	3-4	Homomorphism	Boolean algebras De Morgan's laws Boolean homomorphism
28th Oct-2nd Nov			MID SEMESTER BREAK
4th Nov-	4	Boolean Function	Representation theorem.

9th Nov			Boolean polynomials. Boolean polynomial functions
11th Nov-16th Nov	4	Boolean Function	Equivalence of Boolean polynomials. Disjunctive normal form and conjunctive normal form of Boolean polynomials. Minimal forms of Boolean polynomials.
18th Nov-23rd Nov	4	Boolean Grap	Quine-McCluskey method. Karnaugh diagrams. Switching circuits.
25th Nov-27th Nov	4		Applications of Boolean algebras to logic. Set theory. Probability theory.
28th Nov	DISBERSAL OF CLASSES		

Unit	TOPICS
I	**Cardinality and Partially Ordered Sets** The cardinality of a set; Definitions, examples and basic properties of partially ordered sets, Order-isomorphisms, Covering relations, Hasse diagrams, Dual of an ordered set, Duality principle, Bottom and top elements, Maximal and minimal elements, Zorn's lemma, Building new ordered sets, Maps between ordered sets.
II	**Lattices** Lattices as ordered sets, Lattices as algebraic structures, Sublattices, Products, Lattice isomorphism; Definitions, examples and properties of modular and distributive lattices; The M3 – N5 theorem with applications, Complemented lattice, Relatively complemented lattice, Sectionally complemented lattice.
III	**Boolean Algebras and Applications** Boolean algebras, De Morgan's laws, Boolean homomorphism, Representation theorem, Boolean polynomials, Boolean polynomial functions, Equivalence of Boolean polynomials, Disjunctive normal form and conjunctive normal form of Boolean polynomials; Minimal forms of Boolean polynomials, Quine-McCluskey method, Karnaugh diagrams, Switching circuits and applications, Applications of Boolean algebras to logic, set theory and probability theory.

S. No.	Name of Authors/Books/Publishers
1.	Davey, B. A., & Priestley, H. A. Introduction to Lattices and Order (2nd ed.). Cambridge University press, Cambridge, 2002.
2.	Goodaire, Edgar G., & Parmenter, Michael M.. Discrete Mathematics with Graph Theory (3rd ed.). Pearson Education Pvt. Ltd. Indian Reprint,2006.
3.	Lidl, Rudolf & Pilz, Gunter. Applied Abstract Algebra (2nd ed.), Undergraduate Texts in Mathematics. Springer (SIE). Indian Reprint,2004.
4.	Donnellan, Thomas. Lattice Theory (1st ed.). Khosla Pub. House. Indian Reprint,1999