

B.A. (Prog.) with Mathematics as Major (Sem I)
Teaching Plan: (DSC-1: Elements of Discrete Mathematics)

Week 1: Sets, Propositions and logical operations.

[2] Chapter 1 (Section 1.1), and Chapter 2 (Section 2.1).

Week 2: Conditional statements, Mathematical induction.

[2] Chapter 2 (Sections 2.2, and 2.4).

Week 3: Relations and equivalence relation, Equivalence classes, Partial order relation, Partially ordered set.

[1] Chapter 1 (Section 1.1, up to the Definition of POSET).

[2] Chapter 4 (Sections 4.2 (up to Example 16), 4.4, and 4.5).

Weeks 4 and 5: Hasse diagrams, Chain, Maximal and minimal elements, Least and greatest elements, Least upper bound, greatest lower bound in POSETS, Zorn's lemma, Functions and bijective functions.

[1] Chapter 1 (Sections 1.1 to 1.4).

[2] Chapter 5 (Section 5.1).

Week 6 and 7: Functions between POSETS, Order isomorphism, Lattice as a POSET, Lattice as an algebra and their equivalence.

[1] Chapter 1 (Sections 1.5 to 1.10, and 1.12 to 1.14).

[2] Chapter 6 (Section 6.1).

Week 8: Bounded lattice, Sublattice, Interval in a lattice.

[1] Chapter 1 (Sections 1.11, 1.15, and 1.16).

Week 9: Products and homomorphism of lattices, Isomorphism of lattices.

[1] Chapter 1 (Sections 1.17 to 1.20).

Week 10: Distributive lattices, Complemented lattice, Partition and pentagonal lattice.

[1] Chapter 1 (Sections 2.1 to 2.10).

Weeks 11 and 12: Boolean algebra, De Morgan's laws, Boolean expressions, Truth tables, Logic diagrams. [1] Chapter 1 (Sections 3.1 to 3.6); [2] Chapter 6 (Section 6.5).

Week 13: Boolean functions, Disjunctive normal forms (as join of meets), Minimal forms of Boolean polynomials.

[1] Chapter 1 (Sections 4.13, and 4.15 to 4.17).

Week 14: Quine Mc-Cluskey method, Karnaugh maps.

[1] Chapter 1 (Sections 6.1 to 6.5); [2] Chapter 6 (Section 6.6).

Week 15: Switching circuits, Applications of switching circuits.

[1] Chapter 2 (Sections 7, and 8).

References:

1. Rudolf Lidl, & Gunter Pilz (2004). *Applied Abstract Algebra* (2nd ed.). Undergraduate text in Mathematics, Springer (SIE), Indian Reprint.
2. Bernard Kolman, Robert C. Busby, & Sharon Cutler Ross (2009). *Discrete Mathematical Structures* (6th ed.). Pearson education Inc., Indian reprint.