



Department of Applied Mathematics	LP: MA18352
B.E :CS& B.Tech: IT Regulation: 2018	Rev. No: 00
Sub. Code / Sub. Name : MA18352 / Discrete Mathematics	Date:
Unit : III Graph Theory	16.08.2021

Unit Syllabus: Graphs and Graph models – Graph terminology and special types of Graphs – Matrix representation of Graphs and Graph isomorphism – Connectivity – Eulerian and Hamiltonian Graphs

Objective: To understand the fundamental concepts of Graph Theory and Network Connectivity.

Session No *	Topics to be covered	Ref	Teaching Aids
25	Graphs – Introduction, Graph Models	T2, Ch 8, 527-535	BB/PPT
26	Graph Terminology	T2, Ch 8, 536-539	BB/PPT
27	Special Types of Graphs	T2, Ch 8,539-549	BB/PPT
28	Tutorial	T3, Ch1, 1-4	BB/PPT
	CAT-I		
29	Matrix Representation of Graphs-Introduction	T2, Ch 8, 549-553	BB/PPT
30	Adjacency & Incidence Matrices	T3, Ch1, 7-8	BB/PPT
31	Graph Isomorphism	T3, Ch1, 4 - 6	BB/PPT
32	Tutorial	T2, Ch 8, 553-560	BB/PPT
33	Path, Trail, Cycle, Cut Vertex, Cut Edge, Connected Graph	T2, Ch8, 560-571	BB/PPT
34	Euler Tour, Eulerian Graph	T3, Ch 4, 51-53	BB/PPT
35	Hamilton Cycle, Hamiltonian Graph	T3, Ch 4, 53-62	BB/PPT
36	Tutorial	T2, Ch 8, 571-585	BB/PPT

Content beyond syllabus covered (if any):

Application of Graph Theory to solve Practical Problems



Sub. Code / Sub. Name: MA18352 / Discrete Mathematics

Unit : I Propositional Logic

Unit Syllabus: Propositional Logic - Propositional Equivalences-Predicates and Quantifiers – Nested Quantifiers - Inference Theory.

Objective: To extend student's Logical maturity.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to Propositional Logic	T1, Ch 1,1- 5	BB/PPT
2	Conditional and Bi-conditional Statements	T1, Ch 1,5 - 9	BB/PPT
3	Propositional Equivalences and Tautological Implications	T1, Ch 1,21 - 27	BB/PPT
4	Tutorial	R1, Ch 2,56 - 67	BB/PPT
5	Introduction to Predicates & Quantifiers	T1, Ch 1,29 - 40	BB/PPT
6	Nested Quantifiers	T1, Ch 1,47 - 53	BB/PPT
7	Normal Forms	T2, Ch 1,50 - 52	BB/PPT
8	PCNF, PDNF	T2, Ch 1,53 - 58	BB/PPT
9	Tutorial	T2, Ch 1,60	BB/PPT
10	Inference Theory	T1, Ch 1,58 - 60	BB/PPT
11	Rules of Inference	T1, Ch 1,60 - 63	BB/PPT
12	Tutorial	R1, Ch 2,68 - 86	BB/PPT

Content beyond syllabus covered (if any):-

* Session duration: 50 minutes

**Sub. Code / Sub. Name: MA18352/ Discrete Mathematics****Unit : II Combinatorics**

Unit Syllabus: Mathematical Induction – The basics of counting – The pigeonhole principle
– Permutations and combinations – Recurrence relations – Solving linear recurrence relations
– Generating functions – Inclusion and exclusion principle and its applications.

Objective: To introduce the counting principles.

Session No *	Topics to be covered	Ref	Teaching Aids
13	Mathematical Induction	T1, Ch 4,273 - 285	BB/PPT
14	Introduction to the Basics of Counting	T1, Ch 5,335 - 344	BB/PPT
15	The Pigeonhole Principle	T1, Ch 5,347 - 352	BB/PPT
16	Permutations and Combinations	T1, Ch 5,354 - 362	BB/PPT
17	Tutorial	R1, Ch 1,6 – 11, 15 - 19	BB/PPT
18	Recurrence Relations	T1, Ch 6,391 - 396	BB/PPT
19	Solving Linear Recurrence Relations	T1, Ch 6,402 - 412	BB/PPT
20	Generating Functions	T1, Ch 6,424 - 436	BB/PPT
21	Tutorial	R1, Ch 9,387 - 390, Ch10, 415 - 422	BB/PPT
22	Inclusion and Exclusion Principle	T1, Ch 6,440 - 444	BB/PPT
23	Applications	T1, Ch 6,446 - 452	BB/PPT
24	Tutorial	R1, Ch 8,361 - 368	BB/PPT

Content beyond syllabus covered (if any):

Recursion in programming languages

* Session duration: 50 minutes



Sub. Code / Sub. Name: MA18352 / Discrete Mathematics

Unit : IV Algebraic Structures

Unit Syllabus : Algebraic systems – Semi groups and monoids - Groups – Subgroups – Homomorphisms – Cosets - Normal subgroup – Lagrange's theorem – Definitions and examples of Rings and Fields.

Objective: To expose the concepts and properties of Algebraic structures.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Introduction to Algebraic systems- Definitions and Examples	T 2, Ch 3, 271 – 273	BB/PPT
38	Some Simple Algebraic Systems and Properties	T 2, Ch 3, 274 – 280	BB/PPT
39	Semigroups and Monoids – Definition and Examples	T 2, Ch 3, 282 – 286	BB/PPT
40	Homomorphism of Semigroups and Monoids, Subsemigroups and Submonoids	T 2, Ch 3, 287 – 293	BB/PPT
41	Tutorial	T2, Ch 3, 294	BB/PPT
42	Groups – Definition and Examples	T 2, Ch 3, 319 – 327	BB/PPT
43	Subgroups and Homomorphism	T 2, Ch 3, 329 – 332	BB/PPT
44	Cosets and Normal Subgroups	T 2, Ch 3, 333 – 340	BB/PPT
45	Lagrange's Theorem	T 2, Ch 3, 335	BB/PPT
46	Tutorial	R1, Ch16, 701 - 713	BB/PPT
47	Definitions and Examples of Rings and Fields	T 2, Ch 3, 341 – 344	BB/PPT
48	Tutorial	R1, Ch 14, 633	BB/PPT
Content beyond syllabus covered (if any):			

* Session duration: 50 mins



Sub. Code / Sub. Name: MA 18352 / Discrete Mathematics

Unit : V Lattices and Boolean Algebra

Unit Syllabus: Partial ordering – Posets – Lattices as posets – Properties of lattices - Lattices as algebraic systems – Sub lattices – Direct product and homomorphism – Some special lattices – Boolean algebra.

Objective: To introduce Lattices and Boolean Algebra.

Session No *	Topics to be covered	Ref	Teaching Aids
49	Introduction to Partial Ordering –Posets	T 2, Ch3,186– 191	BB/PPT
50	Lattices as Partially Ordered Sets – Definitions and Examples	T2, Ch4,378-381	BB/PPT
51	Some Properties of Lattices	T2, Ch4,382-384	BB/PPT
52	Tutorial	T2, Ch 4,385	BB/PPT
53	Lattices as Algebraic Systems	T2, Ch4,385-386	BB/PPT
54	Sublattices	T2, Ch4,387	BB/PPT
55	Direct Product and Homomorphism	T2, Ch4,387-389	BB/PPT
56	Some Special Lattices	T2, Ch4,392-396	BB/PPT
57	Tutorial	T2, Ch 4,397	BB/PPT
58	Boolean Algebra – Definitions and Examples	T2, Ch4,397-400	BB/PPT
59	Subalgebra, Direct Product and Homomorphism	T2, Ch4,401-404	BB/PPT
60	Tutorial	R1,Ch 15,687 - 695	BB/PPT
	CAT II		
Content beyond syllabus covered (if any): Applications – Finite state machines.			

* Session duration: 50 mins



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TEXTBOOKS:

1. Tremblay J P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata Mc Graw Hill Pub. Co. Ltd, New Delhi, 30th Reprint, 2011.
2. Kenneth H Rosen, "Discrete Mathematics and its Applications", 7th Edition, Tata Mc GrawHill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2011.
3. Bondy J A and Murthy U S R, Graph Theory with Applications, Elsevier Science Publishing Co. Inc. New York, 1982.

REFERENCES:

1. Ralph P Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education, Asia, Delhi, 2002.
2. Thomas Koshy, "Discrete Mathematics with Applications", Elsevier Publications, 2006.
3. Seymour Lipschutz and Mark Lipson, "Discrete Mathematics", Schaum's Outlines, TataMc Graw Hill Publishing Co. Ltd., New Delhi, Third Edition, 2010.

	Prepared by	Approved by
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Date	16.08.2021	16.08.2021
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year, it should be mentioned and signed by the Faculty and the HOD