MOHAMMED SATHAK A J COLLEGE OF ENGINEERING

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN

Department of COMPUTER SCIENCE ENGINEERING & INFORMATION TECHNOLOGY

Name of the Subject	DISCRETE MATHEMATICS	Name of the handling Faculty	S.SUDHA
Subject Code	MA8351	Year / Sem	II/III
Acad Year	2018-2019	Batch	2017-2021

Course Objective

To extend student‘s logical and mathematical maturity and ability to deal with abstraction.

To identify most of the basic terminologies used in computer science courses and application of ideas to solve practical problems.

To Analyse the basic concepts of combinatorics and graph theory.

To familiarize the applications of algebraic structures.

To apply the concepts and significance of lattices and boolean algebra which are widely used in computer science and engineering.

Course Outcome

To Examine the concepts needed to test the logic of a program.

To classify the structures on many levels.

To associate the class of functions which transform a finite set into another finite set which relates to input and output functions in computer science.

To indicate the concept of the counting principles.

To express the concepts and properties of algebraic structures such as groups, rings and fields.

Lesson Plan

Sl. No.	Topic(s)	T / R* Book	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level (L1-L6)	CO	PO
	UNIT I LOGIC AND PROOFS						
1	Introductiion Propositional logic	T1	1	PPT/BB	L1	CO1	PO1,PO3
2	Propositional equivalences	T1	1	PPT/BB	L1	CO1	PO1,PO3
3	Normal Forms	T1	1	PPT/BB	L1	CO1	PO1,PO3

4	Normal Forms	T1	1	PPT/BB	L1	CO1	PO1,PO3
5	Predicates and quantifiers	T1	1	PPT/BB	L3	CO1	PO1,PO3
6	Predicates and quantifiers	T1	1	PPT/BB	L3	CO1	PO1,PO3
7	Nested quantifiers	T1	1	PPT/BB	L3	CO1	PO1,PO3
8	Nested quantifiers	T1	1	PPT/BB	L3	CO1	PO1,PO3
9	Rules of inference	T1	1	PPT/BB	L3	CO1	PO1,PO3
10	Rules of inference	R1	1	PPT/BB	L3	CO1	PO1,PO3
11	Introduction to proofs	R1	1	PPT/BB	L3	CO1	PO1,PO3
12	Proof methods and strategy	R1	1	PPT/BB	L3	CO1	PO1,PO3
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any: Assignment Given in Rules of inference							
Evaluation method							
UNIT II		COMBINATORICS					
13	Mathematical induction	T1	1	PPT/BB	L2	CO2	PO1,PO2, PO3
14	Strong induction and well ordering	T1	1	PPT/BB	L3	CO2	PO1,PO2, PO3
15	The basics of counting	T1	1	PPT/BB	L2	CO2	PO1,PO2, PO3
16	The pigeonhole principle	T1	1	PPT/BB	L3	CO2	PO1,PO2, PO3
17	Permutations and combinations	T1	1	PPT/BB	L2	CO2	PO1,PO2, PO3
18	Recurrence relations	T1	1	PPT/BB	L3	CO2	PO1,PO2, PO3
19	Solving linear recurrence relations	T1	1	PPT/BB	L3	CO2	PO1,PO2, PO3
20	Solving linear recurrence relations	T1	1	PPT/BB	L1	CO2	PO1,PO2, PO3
21	Generating functions	T1	1	PPT/BB	L3	CO2	PO1,PO2, PO3
22	Generating functions	R2	1	PPT/BB	L3	CO2	PO1,PO2, PO3
23	Inclusion and exclusion principle and its applications	R2	1	PPT/BB	L3	CO2	PO1,PO2, PO3
24	Inclusion and exclusion principle and its applications	R2	1	PPT/BB	L3	CO2	PO1,PO2, PO3
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any. Assignment-2 given on generating functions.							

Evaluation method							
UNIT III GRAPH THEORY AND APPLICATIONS							
25	Introduction - Graph Terminologies	T1	1	PPT/BB	L1	CO3	PO1,PO2
26	Types of Graphs	T1	1	PPT/BB	L1	CO3	PO1,PO2
27	Sub Graph	T1	1	PPT/BB	L1	CO3	PO1,PO2
28	Matrix representation of graphs	T1	1	PPT/BB	L2	CO3	PO1,PO2
29	Regular Graph	T1	1	PPT/BB	L2	CO3	PO1,PO2
30	Isomorphic Graphs	T1	1	PPT/BB	L3	CO3	PO1,PO2
31	Isomorphism- Sub Graph	T1	1	PPT/BB	L3	CO3	PO1,PO2
32	Isomorphism- Sub Graph	T1	1	PPT/BB	L3	CO3	PO1,PO2
33	Euler graph	R1	1	PPT/BB	L3	CO3	PO1,PO2
34	Related Theorems	R1	1	PPT/BB	L3	CO3	PO1,PO2
35	Hamiltonian Graph	R1	1	PPT/BB	L3	CO3	PO1,PO2
36	Related Theorems	R1	1	PPT/BB	L3	CO3	PO1,PO2
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any. Assignment-3 given based on maps: Draw a graph from college to their home.							
Evaluation method							
UNIT IV ALGEBRAIC STRUCTURES							
37	Algebraic systems	T1	1	PPT/BB	L1	CO4	PO1
38	Semi groups and monoids	T1	1	PPT/BB	L2	CO4	PO1
39	Groups	T1	1	PPT/BB	L1	CO4	PO1
40	Subgroups	T1	1	PPT/BB	L2	CO4	PO1
41	Homomorphism‘s	T1	1	PPT/BB	L2	CO4	PO1
42	Normal subgroup	T1	1	PPT/BB	L2	CO4	PO1
43	Cosets	T1	1	PPT/BB	L2	CO4	PO1
44	Cosets	T1	1	PPT/BB	L2	CO4	PO1

45	Lagrange‘s theorem	T1	1	PPT/BB	L2	CO4	PO1
46	Lagrange‘s theorem	R2	1	PPT/BB	L2	CO4	PO1
47	Definitions and examples of Rings	R2	1	PPT/BB	L2	CO4	PO1
48	Definitions and examples of Fields	R2	1	PPT/BB	L2	CO4	PO1
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any. Assignment-4 given normal subgroup.							
Evaluation method							
UNIT V LATTICES AND BOOLEAN ALGEBRA							
49	Partial ordering	T1	1	PPT/BB	L1	CO5	PO1,PO3
50	Posets	T1	1	PPT/BB	L1	CO5	PO1,PO3
51	Lattices as posets	T1	1	PPT/BB	L1	CO5	PO1,PO3
52	Lattices as posets-Theorems	T1	1	PPT/BB	L2	CO5	PO1,PO3
53	Properties of lattices	T1	1	PPT/BB	L2	CO5	PO1,PO3
54	Lattices as algebraic systems	T1	1	PPT/BB	L2	CO5	PO1,PO3
55	Lattices as algebraic systems	T1	1	PPT/BB	L2	CO5	PO1,PO3
56	Sub lattices	T1	1	PPT/BB	L2	CO5	PO1,PO3
57	Sub lattices-Theorems	T1	1	PPT/BB	L2	CO5	PO1,PO3
58	Direct product and homomorphism	R1	1	PPT/BB	L2	CO5	PO1,PO3
59	Some special lattices	R1	1	PPT/BB	L2	CO5	PO1,PO3
60	Some special lattices	R1	1	PPT/BB	L2	CO5	PO1,PO3
Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any: Assignment-5 given Lattices							
Evaluation method							
Content Beyond the Syllabus Planned							
1							
2							
Text Books							

1	Rosen, K.H., "Discrete Mathematics and its Applications", 7th Edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi, Special Indian Edition, 2011.
2	Tremblay, J.P. and Manohar.R, " Discrete Mathematical Structures with Applications to
3	
Reference Books	
1	Grimaldi, R.P. "Discrete and Combinatorial Mathematics: An Applied Introduction", 4th Edition, Pearson Education Asia, Delhi, 2007.
2	Lipschutz, S. and Mark Lipson., "Discrete Mathematics", Schaum's Outlines, Tata McGraw Hill Pub. Co. Ltd., New Delhi, 3rd Edition, 2010.
3	Koshy, T. "Discrete Mathematics with Applications", Elsevier Publications, 2006.
Website / URL References	
1	https://onlinecourses.nptel.ac.in
2	
3	

Blooms Level

Level 1 (L1) : Remembering Level 2 (L2) : Understanding Level 3 (L3) : Applying	Lower Order Thinking	Fixed Hour Exams	Level 4 (L4) : Analysing Level 5 (L5) : Evaluating Level 6 (L6) : Creating		Higher Order Thinking	Projects / Mini Projects

Mapping syllabus with Bloom's Taxonomy LOT and HOT

Unit No	Unit Name	L1	L2	L3	L4	L5	L6	LOT	HOT	Total
Unit 1	LOGIC AND PROOFS	4	8	0	0	0	0	12	0	12
Unit 2	COMBINATORICS	2	3	7	0	0	0	12	0	12
Unit 3	GRAPHS	2	3	7	0	0	0	12	0	12
Unit 4	ALGEBRAIC STRUCTURES	2	10	0	0	0	0	12	0	12
Unit 5	LATTICES AND BOOLEAN ALGEBRA	3	9	0	0	0	0	12	0	12
Total		13	33	14	0	0	0	60	0	60
Total Percentage		21.67	55	23.33	0	0	0	100	0	100

CO PO Mapping

	PO1	PO2	PO3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	0	0	0	0	0	0	0	0	1	0	0
CO2	3	3	2	0	0	0	0	0	0	0	0	1	0	0
CO3	3	3	2	0	0	0	0	0	0	0	0	1	0	0
CO4	3	3	2	0	0	0	0	0	0	0	0	1	0	0
CO5	3	3	2	0	0	0	0	0	0	0	0	1	0	0

Avg	3	3	2	0	0	0	0	0	0	0	0	1	0	0

Justification for CO-PO mapping

CO1	**Summarize the concept of elementary mathematical logical arguments.**
CO2	**Apply basic counting techniques to solve combinatorial problems.**
CO3	**Associate the applications of Graph theory models and data structures.**
CO4	**Describe the concepts and properties of algebraic structures such as groups, rings and fields.**
CO5	**Extend the concepts of Boolean algebra in the area of lattices and apply the knowledge of argumental deiscrete mathematical problems**

3	**High level**	**2**	**Moderate level**	**1**	Low level

Name & Sign of Faculty Incharge :

Name & Sign of Subject Expert :

Head of the Department :

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