Department Of Computer Science and Engineering

Lesson Plan cum Diary 2015-16

Name of the Subject   : DISCRETE STRUCTURES AND GRAPH THEORY (14MT10505)
Name of the faculty Members : M. Sunil Kumar
Class & Semester   : I M.Tech I semester

S. No.	Topic	No. of periods required	Date(s) covered	No. of periods used	Book(s) followed	Self Learning Concepts
UNIT-I: MATHEMATICAL LOGIC, PREDICATES						
1.	Statements and notations, Connectives	1			T1	Identify the basic application of automatic theorem proving
2.	Well formed formulas	1			T1	
3.	Truth Tables	1			T1	
4.	equivalence implication	1				
5.	Normalforms	1			T1	
6.	**Predicates:** Predicative logic	1			T1	
7.	Free & Bound variables	1			T1	
8.	Rules of inference	1			T1	
9.	Consistency	1			T1	
10.	Proof of contradiction	1			T1	
11.	Automatic Theorem Proving	1				
Total no of periods required:		**11**	Total no of periods used:			
UNIT-II: SET THEORY, FUNCTIONS, ALGEBRAIC STRUCTURES						
12.	**SET THEORY:** Properties of binary relations	1			T1	(1)Study Cyclic groups (2) Examine special types of lattices
13.	Equivalence	1				
14.	Compatibility and Partial Ordering Relations	1			T1	
15.	Hasse diagram	1			T1	
16.	Lattice and its properties	1			T1	
17.	**FUNCTIONS:** Inverse functions	1			T1	
18.	Composite of Functions	1				
19.	Recursive functions	1				
20.	**ALGEBRAIC STRUCTURES** examples and general properties	1			T1	
21.	Semi groups and Monoids	1				
22.	Groups and Sub groups	1				
23.	Homomorphism, Isomorphism	1				

	Total no of periods required:	**12**		Total no of periods used:		

UNIT-III: ELEMENTARY COMBINATORICS, RECURRENCE RELATIONS

24.	Basis of counting, Combinations & Permutations with repetitions	1			T1	
25.	Constrained repetitions	1				
26.	Binomial Coefficients	1			T1	
27.	Binomial and Multinomial theorems	1			T1	
28.	The principles of Inclusion	1			T1	(1)Study the advanced counting principles 2)Identify the advanced concepts on generating functions
29.	Exclusion, Pigeon hole principles and its application.	1				
30.	**RECURRENCE RELATIONS**	1			T2	
31.	Generating functions	1			T2	
32.	Function of Sequences	1			T2	
33.	Calculating coefficient of generating function	1			T2	
34.	Recurrence relations, Solving recurrence relation by substitution and Generating functions	1			T2	
35.	Characteristics roots solution of in homogeneous recurrence relation	1			T2	
	Total no of periods required:	**12**		Total no of periods used:		

UNIT-IV: GRAPHS

36.	Introduction to Graphs, Types of Graphs	1			T2	Apply the advanced graph based algorithm for graph coloring with 5 chromatic number
37.	Graph basic terminology and Special types of simple graphs	2			T2	
38.	Representation of Graphs and Graph Isomorphism	2			T2	
39.	Euler Paths and Circuits	2			T2	
40.	Hamiltonian Paths and Circuits	2			T2	
41.	Planar Graphs	1			T2	
42.	Euler's formula and Graph coloring	1			T2	
	Total no of periods required:	**11**		Total no of periods used:		

UNIT-V: GRAPH THEORY AND ITS APPLICATIONS

43.	Introduction to Trees, Properties of Trees	1			T2	Binary Trees, AVL Trees
44.	Applications of Trees-Spanning trees	1			T2	
45.	Counting trees	2			T2	
46.	Depth-First Search	1			T2	
47.	Breadth-First Search	1			T2	
48.	Minimum Spanning trees	2				

49.	Kruskal's Algorithm	1					
50.	Prim's Algorithm	1					
	Total no of periods required:	**10**		Total no of periods used:			
	Grand total of periods required:	**56**		**Grand total of periods used:**			

Text Books:

T1: J.P. Trembly and R. Manohar, "*Discrete Mathematical Structures with Applications to Computer Science*," New Delhi:Tata McGraw Hill, 2009.

T2: Kenneth H. Rosen, "*Discrete Mathematics and its Applications*," Sixth edition, New Delhi: Tata Mc Graw Hill, 2009

Reference Books:

R1: Joe L.Mott and Abraham Kandel, "*Discrete Mathematics for Computer Scientists and Mathematicians*," Second edition, New Delhi, Prentice Hall of India Private Limited, 2004.

R2: C.L. Liu and D.P. Mohapatra, "*Elements of Discrete Mathematics*," Third edition, New Delhi: McGraw Hill, 2008.

R3: Ralph P. Grimaldi and B.V.Ramana, "*Discrete and Combinatorial Mathematics- An Applied Introduction*," Fifth edition, New Delhi: Pearson Education, 2006.

Signature of the faculty Member   **Signature of the HOD**