Five Years Integrated M.Sc. (I.T.) (Semester 2)
Lesson Planning
060010212 – DSE2 Advanced Mathematics for Computer Applications

Unit	Sub Unit	No.	Topics	Reference Chapter/Additional	Teaching Methodology
1.		[8]	**Matrix Algebra**		
	1.1	1	Definition and Types	JP#1- Page No.1- 4	Chalk & Talk
	1.2	2	Operations on Matrices	JP#1- Page No.5- 13	
	1.3	2	Ad-joint and Inverse	JP#1- Page No.46-51	
	1.4	2	Solution of System of equations by Matrix Inversion method	JP#1- Page No.52-60	
	1.5	1	Applications of Matrix		
2.		[8]	**Group Theory**		
	2.1	1	Binary and n-ary operations	VR#4 - Page No.189 - 192	Chalk & Talk
	2.2	1	Algebraic System: Definition and Properties	VR#5 - Page No.232 -235 VR#5 - Page No.246 - 247	
	2.3	2	Semi-groups and Monoids	VR#5 - Page No.235 – 238 VR#5 - Page No.248 - 249	
	2.4	1	Sub semi-groups and Sub-monoids	VR#5 - Page No.238,250	
	2.5	1	Group, Order of a Group, Order of an element, Properties of Group	VR#5 - Page No.239 – 241 VR#5 - Page No.251 - 253	
	2.6	1	Permutation Group, Dihedral Group, Cyclic Group, Subgroups	VR#5 - Page No.241 – 246 VR#5 - Page No.254 - 257 VR#5 - Page No.261	
	2.7	1	Applications of Group Theory		
3.		[8]	**Basics of Graph Theory**		
	3.1	1	Basic Terminologies of Directed and Undirected Graphs	VR#7 - Page No.366-369 VR#7 - Page No.375-377	Chalk & Talk
	3.2	3	Special Simple Graphs	VR#7 - Page No.369-371 VR#7 - Page No.377-379	
	3.3	2	Operations on Graphs	UA#4- Page No. 108-110	
	3.4	2	Matrix Representation of Graphs(Adjacency matrix and Incidence matrix)	VR#7 – Page No. 373-374 VR#7 – Page No. 383-384	
4.		[08]	**Graphs Isomorphism, Path and Circuits**		
	4.1	1	Graphs Invariants and Isomorphism	KR#8 – Page No. 559-562	Chalk & Talk
	4.2	1	Walk, Path, Circuit	VR#7 – Page No. 387-388	
	4.3	1	Connectedness in Undirected Graphs	VR#7 – Page No. 388 KR#8- Page No. 568-570	
	4.4	1	Euler Path and Circuit	VR#7 – Page No. 392-393 KR#8- Page No. 577-582	
	4.5	1	Hamiltonian path and Circuit	KR#8- Page No. 582-585	
	4.6	2	Shortest Path in graph: Dijkstra's Algorithm	VR#7 – Page No. 394-396 VR#7- Page No. 405-406	
	4.7	1	Applications of Graph		

5.		**[08]**	**Trees**		
	5.1	2	Introduction of a Tree, Properties of Tree	VR#7 – Page No. 415-416 KR#9- Page No. 627-628 KR#9- Page No. 634-639	Chalk & Talk
	5.2	1	Distance and Center in a tree	ND#3-Page No. 45-46	
	5.3	2	Rooted Tree, Height of a Vertex, Height of a tree, descendent and children of a vertex, leaf, internal vertex	KR#9- Page No. 629-631	
	5.4	2	Binary Tree, Properties of Binary Tree	VR#7- Page No. 418-419	
	5.5	1	Applications of Trees		
6.		**[08]**	**Spanning Trees**		
	6.1	3	Spanning Tree	VR#7- Page No. 416, KR#9- Page No. 668-670	Chalk & Talk
	6.2	4	Minimum Spanning Tree, Prim's and Kruskal's Algorithms.	VR#7- Page No.417,423-425	
	6.3	1	Applications of Spanning Tree		

References :

1. Discrete Mathematics with Graph Theory and Combinatorics, T. Veerarajan, The McGraw Hill Companies.[VR]
2. Calculus by J. P. Singh, Ane Books Pvt. Ltd.[JP].
3. Discrete Mathematics and its Applications with Combinatorics and Graph Theory by Kenneth H Rosen, 6th Edition, Tata McGraw Hill Publishing Company Ltd.[KR]
4. Graph Theory by Udit Agarwal & Umesh Pal Singh, University Science Press, 2009.[UA]
5. Graph Theory with Applications to Engineering and Computer Science, by Narsingh Deo, PHI [ND]

Note: # denotes chapter number.