LECTURE PLAN

Institute/Department	UNIVERSITY INSTITUTE OF COMPUTING (UIC)	**Program**	**Master of Computer Applications (MC305)**
Master Subject Coordinator Name:	Sofia	**Master Subject Coordinator E-Code**:	**E13216**
Course Name	Design and Analysis of Algorithms	**Course Code**	**23CAH-511**

Lecture	Tutorial	Practical	Self Study	Credit	Subject Type
3	0	4	0	5.0	T

Course Type	Course Category	Mode of Assessment	Mode of Delivery
Major Core	Graded (GR)	Hybrid	Hybrid (HYB)

Mission of the Department	M1. To provide innovative learning centric facilities and quality-oriented teaching learning process for solving computational problems. M2. To provide a framework through Project Based Learning to support society and industry in promoting a multidisciplinary activity. M3. To develop crystal clear evaluation system and experiential learning mechanism aligned with futuristic technologies and industry. M4. To provide doorway for promoting research, innovation and entrepreneurship skills in collaboration with industry and academia. M5. To undertake societal activities for upliftment of rural/deprived sections of the society.
Vision of the Department	To be a Centre of Excellence for nurturing computer professionals with strong application expertise through experiential learning and research for matching the requirements of industry and society instilling in them the spirit of innovation and entrepreneurship.

Program Educational Objectives(PEOs)	
PEO1	Establish a well-fortified computing foundation of successful professionals by applying computing fundamentals and domain-specific knowledge, demonstrating their innovative skills and considering social and environmental concerns.
PEO2	Undertake successful implementation of ethical solutions as an individual or a member or a leader of a team by investigating, analyzing, formulating and solving complex computing problems in multidisciplinary approaches using modern tools.
PEO3	Enhance professionalism and ethical attitude in the profession while communicating with local, national, and foreign peers, bound within regulations and leading to lifelong learning.
PEO4	Promote awareness for uplifting health, safety, legal, environmental, ethical and cultural diversity issues for serving the society.

Program Specific OutComes(PSOs)	
PSO1	Analyze their abilities in systematic planning, developing, testing and executing complex computing applications in field of Social Media and Analytics, Web Application Development and Data Interpretations.
PSO2	Apprise in-depth expertise and sustainable learning that contributes to multi-disciplinary creativity, permutation, modernization and study to address global interest.

Program OutComes(POs)	
PO1	Apply mathematics and computing fundamental and domain concepts to find out the solution of defined problems and requirements. (Computational Knowledge)
PO2	Use fundamental principle of Mathematics and Computing to identify, formulate research literature for solving complex problems, reaching appropriate solutions. (Problem Analysis)
PO3	Understand to design, analyze and develop solutions and evaluate system components or processes to meet specific need for local, regional and global public health, societal, cultural, and environmental systems. (Design/Development of Solutions)
PO4	Use expertise research-based knowledge and methods including skills for analysis and development of information to reach valid conclusions. (Conduct Investigations of Complex Computing Problems)
PO5	Adapt, apply appropriate modern computing tools and techniques to solve computing activities keeping in view the limitations. (Modern Tool Usage)
PO6	Exhibiting ethics for regulations, responsibilities and norms in professional computing practices. (Professional Ethics)

PO7	Enlighten knowledge to enhance understanding and building research, strategies in independent learning for continual development as computer applications professional. (Life-long Learning)
PO8	Establishing strategies in developing and implementing ideas in multi- disciplinary environments using computing and management skills as a member or leader in a team. (Project Management and Finance)
PO9	Establishing strategies in developing and implementing ideas in multi- disciplinary environments using computing and management skills as a member or leader in a team. (Project Management and Finance)
PO10	Apply mathematics and computing knowledge to access and solve issues relating to health, safety, societal, environmental, legal, and cultural issues within local, regional and global context. (Societal and Environmental Concern)
PO11	Gain confidence for self and continuous learning to improve knowledge and competence as a member or leader of a team. (Individual and Teamwork)
PO12	Learn to innovate, design and develop solutions for solving real life business problems and addressing business development issues with a passion for quality competency and holistic approach. (Innovation and Entrepreneurship)

Text Books

Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Introduction to the Design and Analysis of Algorithms	Anany Levitin	2nd Edition	Pearson	2009
2	Computer Algorithms/C++	Satraj Sahni and Rajsekaran	1st	Computer Science Press	1997
3	Fundamentals of computer algorithms	Ellis Horowitz	2nd Edition	Universities Press	2014

Reference Books

Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Introduction to Algorithms	Thomas H.Cormen, Charles E.Leiserson, Ronal L. Riv	3rd Edition	MIT Press	2009
2	Design and Analysis of Algorithms	S. Sridhar	Latest	Oxford	2014

Course OutCome

SrNo	OutCome
CO1	Understand the basics of different data structures to manage the data
CO2	Analyze the asymptotic performance of algorithms through algorithmic complexity of simple, non-recursive programs.
CO3	Understand the fundamentals of data structures
CO4	Apply and analyze important algorithmic design paradigms and their applications.
CO5	Implement the major graph algorithms to model engineering problems

Lecture Plan Preview-Theory

Unit No	LectureNo	ChapterName	Topic	Text/ Reference Books	Pedagogical Tool**	Mapped with CO Numer (s)
1	1	CH-1.1: Introduction	Characteristics of algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO1
1	2	CH-1.1: Introduction	Characteristics of algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO1

1	3	CH-1.1: Introduction	Algorithm Specification	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO1
1	4	CH-1.1: Introduction	Analysis Framework	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO1
1	5	CH-1.1: Introduction	Analysis Framework	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO1
1	6	CH-1.2: Performance analysis	Space Complexity	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	7	CH-1.2: Performance analysis	Space Complexity	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	8	CH-1.2: Performance analysis	Time Complexity	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	9	CH-1.2: Performance analysis	Time Complexity	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	10	CH-1.3: Asymptotic Notations	Big-Oh notation(O)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	11	CH-1.3: Asymptotic Notations	Big-Oh notation(O)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	12	CH-1.3: Asymptotic Notations	Omega notation(?)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	13	CH-1.3: Asymptotic Notations	Omega notation(?)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	14	CH-1.3: Asymptotic Notations	Theta notation(T)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	15	CH-1.3: Asymptotic Notations	Little-oh notation(o)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2

1	16	CH-1.3: Asymptotic Notations	Mathematical analysis of Non-Recursive and recursive Algorithms With Examples	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	17	CH-1.3: Asymptotic Notations	Mathematical analysis of Non-Recursive and recursive Algorithms With Examples	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO2
1	18	CH-1.4: Searching and Sorting	Binary Search	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	19	CH-1.4: Searching and Sorting	Linear Search	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	20	CH-1.4: Searching and Sorting	Quick Sort	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	21	CH-1.4: Searching and Sorting	Bubble sort	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	22	CH-1.4: Searching and Sorting	Merge sort	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	23	CH-1.5: Fundamental Data Structures	Linked lists (Single, double and circular)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	24	CH-1.5: Fundamental Data Structures	Linked lists (Single, double and circular)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	25	CH-1.5: Fundamental Data Structures	Operations (Traversing, Insertion and Deletion)	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	26	CH-1.5: Fundamental Data Structures	Stacks, Queues	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	27	CH-1.5: Fundamental Data Structures	Graphs	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
1	28	CH-1.5: Fundamental Data Structures	AVL tree, B Trees	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3

2	29	CH-2.1: Divide and conquer	General method, Advantages and disadvantages of divide and conquer	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
2	30	CH-2.1: Divide and conquer	Decrease and Conquer approach: Topological Sort.	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO3
2	31	CH-2.2: Greedy Method	General method, Fractional Knapsack Problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	32	CH-2.2: Greedy Method	General method, Fractional Knapsack Problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	33	CH-2.3: Minimum cost Spanning trees	Prim’s Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	34	CH-2.3: Minimum cost Spanning trees	Prim’s Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	35	CH-2.3: Minimum cost Spanning trees	Kruskal's algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	36	CH-2.3: Minimum cost Spanning trees	Kruskal's Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	37	CH-2.3: Minimum cost Spanning trees	Single Source Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	38	Ch-2.4: Shortest paths	Dijkstra's Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	39	Ch-2.4: Shortest paths	Dijkstra's Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	40	CH-2.5: Optimal Tree Problem	Huffman Tres and COdes	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
2	41	CH-2.5: Optimal Tree Problem	Huffman Tres and COdes	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4

2	42	CH-2.6: Transform and Conquer Approach	Heap and Heap Sort	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
3	43	CH-3.1: Dynamic Programming	General method with Examples, Multistage Graphs	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
3	44	CH-3.1: Dynamic Programming	Multistage Graphs	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
3	45	CH-3.2: Transitive Closure	Warshall's algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
3	46	CH-3.2: Transitive Closure	All pairs algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO4
3	47	CH-3.3: Shortest Paths	Floyd's Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	48	CH-3.3: Shortest Paths	Optimal Binary Search Trees	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	49	CH-3.3: Shortest Paths	Knapsack problem 0/1	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	50	CH-3.3: Shortest Paths	Bellman-Ford Algorithm	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	51	CH-3.3: Shortest Paths	Travelling Sales Person Problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	52	CH-3.3: Shortest Paths	Travelling Sales Person Problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	53	CH-3.4: Backtracking:General method	N-Queens Problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	54	CH-3.4: Backtracking:General method	Sum of subset problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5

3	55	CH-3.4: Backtracking:General method	Graph Coloring	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	56	CH-3.4: Backtracking:General method	Hamilton cycles	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	57	CH-3.5: Branch and Bound	Assignment problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	58	CH-3.5: Branch and Bound	Travelling Sales Person problem	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	59	CH-3.5: Branch and Bound	Knapsack 0/1	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	60	CH-3.6: Knapsack Problem	LC Branch and Bound solution	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	61	CH-3.7: Types of Complexity Classes	P class	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	62	CH-3.7: Types of Complexity Classes	NP Class	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	63	CH-3.7: Types of Complexity Classes	CoNP Class	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	64	CH-3.7: Types of Complexity Classes	NP-hard	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5
3	65	CH-3.7: Types of Complexity Classes	NP-Complete	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Video Lecture	CO5

Lecture Plan Preview-Practical

Unit No	ExperimentNo	Experiment Name	Text/ Reference Books	Pedagogical Tool**	Mapped with CO Numer(s)
1	1	Sort a given set of elements using the Quick sort	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO1

1	2	implement a parallelized Merge Sort algorithm to s	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO2
1	3	Print all the nodes reachable using BFS & DFS meth	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO3
2	4	Find Minimum Cost Spanning Tree using Kruskal's al	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO4
2	5	find shortest paths to other vertices using Dijkst	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO4
2	6	Obtain Topological ordering of vertices in graph &	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO3,CO4
3	7	Compute transitive closure using Warshall's Algori	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO4,CO5
3	8	Sum of Subset problem of n positive integers	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO5
3	9	Implement Travelling Sales Person problem to find	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO5
3	10	Implement 8-Queens problem using any technique	,T-Computer Algorithms/C++,T-Fundamentals of computer algor,T-Introduction to the Design and,R-Design and Analysis of Algorit,R-Introduction to Algorithms	PPT,Simulation,Video Lecture	CO5

Assessment Model			
Sr No	Assessment Name	Exam Name	Max Marks
1	Hybrid Course All	Practical Evaluations	40
2	Hybrid Course All	End Term Hybrid Theory	60
3	Hybrid Course All	Attendance Marks	2
4	Hybrid Course All	Surprise Test	12
5	Hybrid Course All	practical MST	10
6	Hybrid Course All	Practical Worksheet/Projects 1	30
7	Hybrid Course All	Practical Worksheet/Projects 2	30
8	Hybrid Course All	Practical Worksheet/Projects 3	30

9	Hybrid Course All	Practical Worksheet/Projects 4	30
10	Hybrid Course All	Practical Worksheet/Projects 5	30
11	Hybrid Course All	Practical Worksheet/Projects 6	30
12	Hybrid Course All	Practical Worksheet/Projects 7	30
13	Hybrid Course All	Practical Worksheet/Projects 8	30
14	Hybrid Course All	Practical Worksheet/Projects 9	30
15	Hybrid Course All	Practical Worksheet/Projects 10	30
16	Hybrid Course All	Quiz	4
17	Hybrid Course All	Assignment/GD Hybrid	10
18	Hybrid Course All	MST-1 Hybrid	20
19	Hybrid Course All	MST-2 Hybrid	20