LECTURE PLAN

Institute/Department	UNIVERSITY INSTITUTE OF COMPUTING (UIC)	**Program**	**Master of Computer Applications (MC305)**
Master Subject Coordinator Name:	Maajid Bashir	**Master Subject Coordinator E-Code**:	**E17205**
Course Name	Design and Analysis of Algorithms Lab	**Course Code**	**24CAP-612**

Lecture	Tutorial	Practical	Self Study	Credit	Subject Type
0	0	4	0	2.00	P

Course Type	Course Category	Mode of Assessment	Mode of Delivery
Major Core	Graded (GR)	Practical Examination (PRAC)	Practical (PRAC)

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.

Text Books

Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L.	4th Edition	MIT Press	2022
2	Algorithms in Python: A Step-by-Step Guide Language	Kun Ren	1st Edition	Springer	2023
3	Data Structures and Algorithm Analysis in C++	Mark Allen Weiss	4th Edition	Pearson	2024

Reference Books

Sr No	Title of the Book	Author Name	Volume/Edition	Publish Hours	Years
1	he Art of Computer Programming (Volumes 1–4)	Donald E. Knuth	4th Edition (Volume 1), 3rd Edition (Volumes 2–4)	Addison-Wesley	2011 (Volume 4A)
2	Algorithms	Robert Sedgewick and Kevin Wayne	4th Edition	Addison-Wesley	2011
3	Data Structures and Algorithm Analysis in C++	Mark Allen Weiss	4th Edition	Pearson	2013

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 structure
CO4	Apply and analyze important algorithmic design paradigms and their applications
CO5	Implement the major graph algorithms to model engineering problems

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-Algorithms in Python: A Step-b,T-Introduction to Algorithms,R-Algorithms	Hand On Activity based,Simulation Practical,Video Demonstration	CO1,CO2,CO3
1	2	Implement a parallelized Merge Sort algorithm	,T-Algorithms in Python: A Step-b,T-Introduction to Algorithms,R-Algorithms,R-he Art of Computer Programming	Hand On Activity based,Simulation Practical,Video Demonstration	CO1,CO2,CO3
1	7	Air Traffic Control	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Infographics Practical,Instructor Lead Workshop Practical,Professor of Practice/Adjunct Faculty/Visiting Professors,Simulation Practical,Video Demonstration	CO1,CO2,CO3,CO4,CO5
2	3	Minimum Cost Spanning Tree of a given graph using	,T-Algorithms in Python: A Step-b,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm	Hand On Activity based,Simulation Practical,Video Demonstration	CO4,CO5
2	4	shortest paths to other vertices using Dijkstra's	,T-Algorithms in Python: A Step-b,T-Introduction to Algorithms,R-Algorithms,R-he Art of Computer Programming	Hand On Activity based,Video Demonstration	CO4,CO5
2	8	Farm Irrigation Network	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Infographics Practical,Instructor Lead Workshop Practical,Professor of Practice/Adjunct Faculty/Visiting Professors,Simulation Practical,Video Demonstration	CO1,CO2,CO3,CO4,CO5
3	5	1/0 Knapsack	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Infographics Practical,Instructor Lead Workshop Practical,Professor of Practice/Adjunct Faculty/Visiting Professors,Simulation Practical,Video Demonstration	CO4

3	6	Sum of Subset problem	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Video Demonstration	CO2,CO3,CO4,CO5
3	9	Maze	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Infographics Practical,Instructor Lead Workshop Practical,Professor of Practice/Adjunct Faculty/Visiting Professors,Simulation Practical,Video Demonstration	CO1,CO2,CO3,CO4,CO5
3	10	Find the Transitive Closure of a graph	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Infographics Practical,Instructor Lead Workshop Practical,Professor of Practice/Adjunct Faculty/Visiting Professors,Simulation Practical,Video Demonstration	CO5
3	11	Minimum Spanning Tree of the graph using Prims	,T-Algorithms in Python: A Step-b,T-Data Structures and Algorithm ,T-Introduction to Algorithms,R-Algorithms,R-Data Structures and Algorithm ,R-he Art of Computer Programming	Hand On Activity based,Video Demonstration	CO5

Assessment Model			
Sr No	Assessment Name	Exam Name	Max Marks
1	24PRAC02	External Viva / Voce	40
2	24PRAC02	Attendance (Practical)	2
3	24PRAC02	Practical Worksheet 1	30
4	24PRAC02	Practical Worksheet 2	30
5	24PRAC02	Practical Worksheet 3	30
6	24PRAC02	Practical Worksheet 4	30
7	24PRAC02	Practical Worksheet 5	30
8	24PRAC02	Practical Worksheet 6	30
9	24PRAC02	Lab MST	10
10	24PRAC02	Experimental Learning [EXL] - Mini Projects	6