

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
FACULTY OF ENGINEERING AND TECHNOLOGY
SCHOOL OF COMPUTING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
COURSE PLAN

Course Code: 15CS204J

Course Title : Algorithm Design and Analysis

Semester: IV

Course Time: Jan-May2018

COURSE SCHEDULE:

Day	Hour	E slot/ E1 Timing	Hour	E slot/E2 Timing
Day 1	-	-	-	
Day 2	-	-	-	
Day 3	3	9.45- 10.35 a.m	8	2.20-3.10pm
Day 4	-	-	-	-
Day 5	1,2	8.00-9.40 a.m	6,7	12.30-2.15pm

FACULTY DETAIL:

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B2	Ms.J.V.Vidhya	TP603	MONDAY-FRIDAY	vidhya.j@ktr.srmuniv.ac.in
B2	Ms.R.Radha	TP606	MONDAY-FRIDAY	radha.ra@ktr.srmuniv.ac.in

TEXT BOOKS

1. Ellis Horowitz, Sartaj Sahni, Sanguthevar, Rajasekaran, "Fundamentals of Computer Algorithms", Galgotia Publication Pvt. Ltd., Reprint, 2010.
2. Thomas H Cormen, Charles E Leiserson, Ronald L Rivest, Clifford Stein, "Introduction to Algorithms" 3rd Edition, The MIT Press Cambridge, Massachusetts London, England, 2014
3. S.Sridhar, "Design and Analysis of Algorithms", Oxford University Press, 2015
4. Richard Johnsonbaugh, Marcus Schaefer, "Algorithms", Pearson Education, 2004
5. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education, Inc., 2006
6. Rajesh K Shukla, "Analysis and Design of Algorithms-A Beginner's Approach", Wiley publisher, 2015

INSTRUCTIONAL OBJECTIVES

1. Apply Mathematical concepts and notations to define a problem
2. Apply divide and conquer method to solve a problem
3. Ability to solve real life problems with these algorithmic techniques
4. Familiarize the concept of multidisciplinary functions
5. Interpret data using NP problems and applications of various algorithms to solve real life problems

ASSESSMENT DETAILS

Cycle Test I	15 Marks
Surprise test	5 Marks
Quiz	5 Marks
Cycle Test II	25 Marks

**TEST
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S.No.	Test	Topics	Duration
1.	Cycle Test I	Unit I and II	2 periods
2.	Surprise Test	From completed units	1 period
3.	Cycle test II	3 Units(3,4,5)	3 hours

DETAILED LESSON PLAN

Session	Description of Topic	Contact hours	C-D- I-O	IOs	References
UNIT-1: INTRODUCTION TO ALGORITHM DESIGN		10 HOURS			
1.	Fundamentals of algorithm (Line count, operation count)	1	C	1	2,3,6
2.	Algorithm Design Techniques Approaches, Design Paradigms)	1	C	1	1,2,3,6
3.	Designing an algorithm and its Analysis (Best ,Worst & Average Case)	2	C,D	1,3	1,2,3,6
4.	Asymptotic Notations(O, Ω, Θ) based on Orders of Growth	1	C,I	1	1,2,3,6
5.	Mathematical Analysis - Induction	1	C	1	3,4
6.	Recurrence Relation - Substitution method	1	C	1	3,2
7.	Recurrence Relation - Recursion method	2	C	1	2,3
8.	Recurrence Relation - Master's Theorem	1	C	1	2
UNIT-II: DIVIDE AND CONQUER		8 HOURS			
9.	Introduction, Binary Search	1	D,I	2	1,3
10.	Merge sort and its algorithm analysis	1	C,D	2	1,3
11.	Quick sort and its algorithm analysis	2	D,I	2	1,3
12.	Strassen's Matrix multiplication	1	C	2	1,3
13.	Finding Maximum and minimum	1	D,I	2,3	1,3
14.	Algorithm for finding closest pair	1	C,I	2	3,5
15.	Convex Hull Problem	1	C	2	1,3
UNIT-III: GREEDY AND DYNAMIC PROGRAMMING		9 HOURS			
16.	Introduction - Greedy- Huffman Coding	1	C	3	1
17.	Greedy - Knapsack Problem	1	C,D,I	3	1,3
18.	Greedy - Minimum Spanning Tree (Kruskals Algorithm)	2	C,D,I	3	1,3
19.	Introduction - Dynamic Programming - 0/1 Knapsack Problem	1	C,D	3	1,3
20.	Dynamic Programming - 0/1 Knapsack Problem	1	C	3	1,3
21.	Dynamic Programming- Travelling Salesman Problem	1	C,D	3	1,3
22.	Dynamic Programming- Multistage Graph- Forward path and backward path	2	C,D,I	3	1
UNIT-IV: BACKTRACKING		9 HOURS			
23.	Introduction - NXN Queen's Problem	1	C	4	1,2
24.	NXN Queen's Problem	1	D,I	4	1,2

25.	Sum Of Subsets	1	D,I	4	1,3
26.	Graph Coloring	2	D,I	3,4	1
27.	Hamiltonian's Circuit	1	C	3,4	1
28.	Travelling Salesman Problem	2	C	3,4	1,3
29.	Generating Permutation	1	C	1	2,4
UNIT-V: BRANCH BOUND & RANDOMIZED ALGORITHM					
30.	Branch and bound - 0/1 Knapsack	1	D,I	4	1,3
31.	Branch and Bound - Travelling Sales man Problem	1	C,I	3,4	1,3
32.	Randomized algorithm- Hiring Problem	1	C,I	3,4	2
33.	Randomized algorithm- Matrix Chain Multiplication	1	C,I	3,4	1,2
34.	Randomized Quick Sort	1	C	4	2
35.	Introduction to PN problems	1	C	5	5
36.	Introduction to NP problems	1	C	5	5
37.	NP Complete	2	C	5	4,5
Total hours		45			

COURSE COORDINATORS

Mr.K.Senthil Kumar/ Ms.A.Jackulin Mahariba

AP/CSE

APPROVED BY

Dr.B.Amutha

HOD/CSE