SCHEME OF COURSE WORK

Department of Computer Science and Engineering

Course Details:

COURSE TITLE	**DATA STRUCTURES AND ALGORITHMS LAB**		
COURSE CODE	**22CT1106**	L T P C	0 0 3 1.5
PROGRAM	B.TECH		
SPECIALIZATION	CSE		
SEMESTER	III Semester		
PRE-REQUISITES	C PROGRAMMING		
COURSES TO WHICH IT IS A PRE-REQUISITE	ADVANCED DATA STRUCTURES		

Course Outcomes (COs):

CO1	develop programs using recursive functions. (L3)
CO2	implement stacks and queues. (L3)
CO3	develop Programs for searching and sorting techniques. (L3)
CO4	implement different types of trees. (L3)
CO5	apply the concepts of graphs. (L3)

Program Outcomes (POs):

PO 1	Graduates will be able to apply the knowledge of mathematics, science, engineering fundamentals and principles of Computer Science & Engineering to solve complex problems in different domains.
PO 2	Graduates can identify, formulate, study contemporary domain literature and analyze real life problems and make effective conclusions using the basic principles of science and engineering.
PO 3	Graduates will be in a position to design solutions for Engineering problems requiring in-depth knowledge of Computer Science and design system components and processes as per standards with emphasis on privacy, security, public health and safety.
PO 4	Graduates will be able to conduct experiments, perform analysis and interpret data as per the prevailing research methods and to provide valid conclusions.
PO 5	Graduates will be able to select and apply appropriate techniques and use modern software design and development tools. They will be able to predict and model complex engineering activities with the awareness of the practical limitations.
PO 6	Graduates will be able to carry out their professional practice in Computer Science & Engineering by appropriately considering and weighing the issues related to society and culture and the consequent responsibilities.
PO 7	Graduates would understand the impact of the professional engineering solutions on environmental safety and legal issues
PO 8	Graduates will transform into responsible citizens by adhering to professional ethics.
PO 9	Graduates will be able to function effectively in a large team of multidisciplinary streams consisting of persons of diverse cultures without forgetting the significance of each individual's contribution.
PO 10	Graduates will be able to communicate effectively about complex engineering activities with the engineering community as well as the general society, and will be able to prepare reports.
PO 11	Graduates will be able to demonstrate knowledge and understanding of the engineering and management principles and apply the same while managing projects in multidisciplinary environments.
PO 12	Graduates will engage themselves in self and life-long learning in the context of rapid technological changes happening in Computer Science and other domains.

Course Outcomes (CO) versus **Program Outcomes (PO)**

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3			3	2				1		3	1
CO2	3			2							3	1
CO3	3	2		1							3	1
CO4	3			2							3	1
CO5		3		2	1						3	1

3 - Strongly correlated, 2- Moderately correlated, 1-Poor correlated, Blank - No correlation

Programme Specific Outcomes (PSOs)

PSO1	Identify the working of algorithms and apply the knowledge to solve various specific problems in various domains by using the fundamentals of data structures.
PSO2	Understand the working of time complexities and space complexity of each solution for real time problems.
PSO3	Design the algorithms to model the automation systems for modernizing contemporary societal, Industrial, organizational and public welfare needs with rational insight.

Course Outcomes (CO) versus **Programme Specific Outcomes (PSOs)**

Course Outcome	PSO1	PSO2	PSO3
CO1	3	1	
CO2	3		
CO3	3		
CO4	3		
CO5	3		

3 - Strongly correlated, 2- Moderately correlated, 1-Poor correlated, Blank - No correlation

Assessment Methods	Daily Performance (Record/Observation/Viva): 20 Marks Record: 5Marks, Observation: 10Marks, Viva: 5 Marks Internal Exam : 40 Marks(Exam+Daily Performance) External Exam: 60Marks

Teaching- Learning & Evaluation

Week	Topic/ Contents	Course Outcomes	Sample questions	Teaching learning strategy	Assessment method & schedule
1	Search Algorithms	CO1	1. Write a program for searching an element in an array by using binary search 2. Write a program to search an element by using fibonacci search	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- I
2	Sorting techniques	CO1	1. Write a program to sort list of elements by using selection sort 2. Write a program to sort the elements by using bubble and insertion sort	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- I
3	Sorting techniques	CO1	1. Write a program to sort the elements by using quick sort 2. Write a program to sort the elements by using merge sort	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- I
4	Abstract data types	CO2	1. Write a program that implements the following data structures using arrays: i)Stack ii) Queue.	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- I
5	Stack applications and queues	CO2	1. Write a program to implement the following Stack applications i)Factorial ii) Infix to postfix expression conversion 2. Write a program to implement priority queue	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- I
6	Linked lists	CO3	1. Write a program to implement the following types of Lists i)Singly linked list ii) Doubly linked list.	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- I
7	Lab Internal Examination- I				
8	Linked lists	CO3	1. Write a program to implement the following types of List i) Doubly linked list.	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- II
9	Binary tree traversals - non linear data structures	CO4	1. Write a program to implement binary tree using arrays and to perform binary tree traversals i) inorder ii) postorder iii) preorder.	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- II

10	Binary search tree traversals	CO4	1. 1. .Write a program to perform the following operations using linked lists: i)Insert an element into a binary search tree. 2. ii)Delete an element from a binary search tree. 3. iii)Search for a key element in a binary search tree.	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- II
11	Graph traversal techniques	CO5	1. Write a program for the implementation of BFS and DFS for a given graph	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- II
12	Minimum spanning tree techniques	CO5	1. Write a program to implement prim's algorithm 2. Write a program to implement kurskals algorithm	Lecture, Programming Demo	Record, Observation, Viva, Internal Examination- II
13	Lab Internal Examination- II				
14	Preparation and End Semester Practical Examination				