CSE334:COMBINATORIAL STUDIES-II

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: assess the conceptual knowledge of all major algorithms of searching and sorting.

CO2 :: analyze various data structures used for storage.

CO3 :: measure their technical knowledge and understanding in the field of theory of computation.

CO4 :: understand the design of operating system and its underlying structure

CO5 :: analyze the working of compiler design and its implementation

CO6 :: demonstrate the knowledge of C programming

Unit I

Analysis and design of algorithms : searching, sorting, hashing, asymptotic worst-case time and space complexity, algorithm design techniques, greedy, dynamic programming, divide and conquer, graph search, minimum spanning tree, shortest path finding algorithms

Unit II

Fundamentals of C programming : recursion, function calling methods, storage classes, operator precedence, operator associativity, data types, dynamic memory allocation, pointers, file handling

Unit III

Data structures : arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs

Unit IV

Theory of computation : regular expressions, finite automata, context free grammars, push down automata, regular languages, context free languages, pumping lemma, Turing machines, undecidability

Unit V

Compiler Design : lexical analysis, parsing, syntax directed translation, intermediate code generation, runtime environments

Unit VI

Operating Systems : processes, threads, inter-process communication, concurrency, synchronization, deadlock, CPU scheduling, memory management, virtual memory, file systems

Text Books:

1. WILEY ACING THE GATE: COMPUTER SCIENCE AND INFORMATION TECHNOLOGY, 2ED, 2021 by ANIL KUMAR VERMA, GAURAV SHARMA, KULDEEP SINGH, WILEY

References:

1. GATE COMPUTER SCIENCE AND INFORMATION TECHNOLOGY by TRISHNA KNOWLEDGE SYSTEMS, Pearson Education India

2. OPERATING SYSTEM CONCEPTS by ABRAHAM SILBERSCHATZ, WILEY

3. DESIGN AND ANALYSIS OF ALGORITHMS by A.V.AHO, J.E. HOPCROFT AND J.D.ULLMAN, PEARSON

4. COMPILERS: PRINCIPLES, TECHNIQUES AND TOOLS by ALFRED V. AHO, JEFFREY D. ULLMAN, MONICA S LAM AND R SETHI, PEARSON

5. INTRODUCTION TO AUTOMATA THEORY, LANGUAGES, AND COMPUTATION by JOHN E. HOPCROFT, RAJEEV MOTWANI AND JEFFREY D. ULLMAN, PEARSON

6. DATA STRUCTURES USING C by AARON M. TENENBAUM, PEARSON

7. C PROGRAMMING: TEST YOUR SKILLS by ASHOK KAMTHANE, PEARSON