CAP778:COMBINATORIAL STUDIES-I

Course Outcomes: Through this course students should be able to

CO1 :: understand the various data structures used for storage.

CO2 :: examine lexical analyzer and parser generator tools working.

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

CO4 :: assess their conceptual knowledge of all major algorithms of searching and sorting.

CO5 :: formulate problem solutions and understand deep concepts of C language.

CO6 :: solve critical technical problems related to operating systems.

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

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

Unit IV

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

Unit V

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

Unit VI

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

Text Books:

1. COMPUTER SCIENCE AND INFORMATION TECHNOLOGY GATE 2020 by ARIHANT EXPERTS, ARIHANT PUBLICATIONS INDIA LTD.

References:

1. OPERATING SYSTEM CONCEPTS: WINDOWS XP UPDATE by SILBERSCHATZ, GALVIN, GAGNE, WILEY

2. INTRODUCTION TO THE DESIGN AND ANALYSIS OF ALGORITHMS by ANANY LEVITIN, PEARSON

3. COMPILERS: PRINCIPLES TECHNIQUES AND TOO by AHO, PEARSON

4. INTRODUCTION TO AUTOMATA THEORY, LANGUAGES, AND COMPUTATION by HOPCROFT, PEARSON

5. DATA STRUCTURES USING C PAPERBACK by AARON M. TENENBAUM, YEDIDYAH LANGSAM, MOSHE J. AUGENSTEIN, PEARSON

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