Nagar Yuvak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

BE SoE and Syllabus 2018

COMPUTER TECHNOLOGY

III SEMESTER

CT2204	Data Structures		L=3	T=0	P=0	Credits=4
Evaluation Scheme	MSEs	TA	ESE	Total	ESE Duration	
	30	10	60	100	3 Hours	

MSEs = Three MSEs of 15 Marks each will conducted and marks of better 2 of these 3 MSEs will be considered for Continuous Assessment

Course Objective	Course Outcomes
• To make students familiar with syntaxes and usages of various programming constructs of C language • To make student understand concept of abstract data types like stacks and queues • To make student understand file handling operations • To create thinking ability needed for implementation of programming logic with proper use of memory	• To identify programming constructs needed to solve real world problems • To implement various abstract data types • To Write program for file handling by using various access modes and operations needed as per the requirement of given problem • To implement programming logic needed for solving given problem

UNIT 1: [7 Hrs]

Types and operations, Iterative constructs and loop invariants, Quantifiers and loops, Structured programming and modular design, Illustrative examples, Scope rules, parameter passing mechanisms, recursion, program stack and function invocations including recursion

UNIT 2: [7 Hrs]

Overview of arrays and array based algorithms - searching and sorting:merge sort,quick sort, Sparse matrices.

UNIT 3: [5 Hrs]

Structures (Records) and array of structures (records). Database implementation using array of records. Dynamic memory allocation and deallocation. Dynamically allocated single and multi-dimensional arrays, polynomial representation.

UNIT 4: [6 Hrs]

Concept of an Abstract Data Type (ADT), Lists as dynamic structures, operations on lists, implementation of linked list using arrays and its operations. Introduction to linked list implementation using self-referential-structures/pointers.

UNIT 5: [7 Hrs]

Stack, Queues and its operations. Implementation of stacks and queues using both array-based and pointer-based structures. Applications of stacks and queues.

UNIT 6: [4 Hrs]

1. Files, operations on them, examples of using file.

Text Books:

SN	Title	Edition	Authors	Publisher
1	Fundamentals of Data Structures in C++	2nd 2009	Ellis Horowitz, Sartaj Sahani, Dinesh Mehta	University Press
2	Data Structures and Program Design In C	2nd 2009	Robert Kruse, Cl Tondo	Pearson Education
3	The C programming Language	2nd Edition	Brian Kernighan , Dennis Ritchie	Prentice Hall

Reference Books:

SN	Title	Edition	Authors	Publisher
1	Data Structures with C	Latest	Seymour Lipschutz	TMH
2	Data structures using C	Latest	Reema Thareja	Oxford
3	Algorithms and Data Structures	First	M.M.Raghuwanshi	Narosa

		June 2019	1.00	Applicable for AY 2019-20 Onwards
Chairperson	Dean (Acad. Matters)	Date of Release	Version	

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COMPUTER TECHNOLOGY

III SEMESTER

CT2205	Lab: Data Structures		L=0	T=0	P=2	Credits=1
Evaluation Scheme	MSEs	TA	ESE	Total	ESE Duration	
	–	40	60	100	—	

Course Objective	Course Outcomes
• To make students familiar with syntaxes and usages of various programming constructs of C language • To make student understand concept of abstract data types like stacks and queues • To make student understand file handling operations • To create thinking ability needed for implementation of programming logic with proper use of memory	• To identify programming constructs needed to solve real world problems • To implement various abstract data types • To Write program for file handling by using various access modes and operations needed as per the requirement of given problem • To implement programming logic needed for solving given problem

List of Programs

1. Program for counting number of digits in a random number
2. Program for generating list of random numerals and print them in words
3. Program to print Pascal's triangle

```
          1
        1   1
      1   2   1
    1   3   3   1
  1   4   6   4   1
1   5   10  10  5   1
```

4. Program for finding GCD of two numbers using factorial method
5. Program for finding GCD of two numbers using recursion. Also, print number of recursive calls.
6. Program for allocating memory dynamically for single dimensional array and sort it using quick sort and merge sort
7. Program for allocating memory dynamically for two-dimensional array printing it in spiral manner.
8. Program to create linked list of cell phone with any 3 attributes as data fields and print it
9. Program to create file for storing details of all the items needed for playing any game of your choice also perform display, insertion of new record at any location, deletion of any record
10. Program to implement stack and print MAX data item from it