

CAL-111-A	Introduction to Computers & C Programming	L	T	P	Cr
		4	0	0	4

(For B. Sc Computer Science)

Objective:

The programming can be taught through C Language. The subject focuses on development of programming skills using C Language.

Note:

For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION – A

UNIT – 1

What are computers, The evolution of computers, Generations, Classification of computers, Block Diagram: Input-output devices, Computer Memory: Primary Memory & secondary Memory, Memory Organization, Input/output Ports, Connector.

UNIT – 2

Number System, Computer Language: Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software concepts: system & application software packages.

UNIT –3

C basics: C Character Set, Identifiers And Keywords, Data Types, Constants, Variables, type of variable and Arrays, Declarations, Expressions Statements, Symbolic Constants, Compound Statements.

SECTION – B

UNIT – 4

Operator: Arithmetic Operators, Unary Operators, Relational And Logical Operators, Assignment Operators, Conditional Operators, Bit Operators.

UNIT – 5

C constructs: If statement, if...else statement, if....else if...else statement, while statement, do....while statement, for statement, switch statement, nested control statement, break operator, continue operator, go to statement return statement.

Unit- 6

C Functions: Definition of function, purpose, importance, declaration, recursion, call by value, call by reference type of function.

Arrays: Arrays, pointers, array & pointer relationship, pointer arithmetic, dynamic memory allocation.

Suggested Readings:**Text Books:**

1. Fundamentals of Computers & Programming with C, A.K. Sharma, Dhanpat Rai Publishing.
2. Gill, Nasib Singh: Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi.
3. Kenneth.A.: C problem solving and programming, Prentice Hall.
4. Y. Kanetkar: Let us C, BPB Publication
5. E. Balaguruswamy: Programming in C, Tata McGraw Hill.

Reference Books:

1. Gottfried, B.: Theory and problems of Programming in C, Schaum Series
2. Sanders, D.: Computers Today, Tata McGraw-Hill.
3. Rajender Singh: Application of IT to Business, Ramesh Publishers
4. Kerninghan & Ritchie: The C Programming Language, PHI.
5. H. Schildt: C-The Complete Reference, Tata McGraw Hill.

CAP-111-A	C Programming Lab	L	T	P	Cr
		0	0	3	2

(For B. Sc Computer Science)

Objective:

The programming can be taught through C Language. The subject focuses on program development using C Language.

- 1- Program to demonstrate the use of variables, and input output statements.
- 2- Program to demonstrate the use of various arithmetic and logical operators.
- 3- Program to demonstrate the use of various decision making statements.
- 4- Program to demonstrate the use of various looping statements.
- 5- Program to demonstrate the implementation of one dimensional array and its various operations
- 6- Program to demonstrate the implementation of two dimensional arrays and its various operations
- 7- Program to demonstrate the implementation of pointers and its arithmetic's
- 8- Program to demonstrate the implementation of call by reference and call by value mechanism.

CAL-112-A	DATA STRUCTURES	L	T	P	Cr
		4	0	0	4

For B. Sc (Computer Science & Information Technology)

Objective: This subject discusses different data structures to represent real world problems and to study various ways to design algorithms to solve the problems.

Note : For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

Section - A

UNIT - I

INTRODUCTION TO DATA STRUCTURES: Definition of data structures and abstract data types; linear vs. non-linear data types; primitive vs. non-primitive data types; Static and Dynamic implementations;

RUNNING TIME: Time Complexity; Big – Oh - notation; Running Times; Best Case; Worst Case; Average Case; Introduction to Recursion; Divide and Conquer Algorithm; Evaluating time Complexity.

Unit II: 1D, 2D and multi-dimensional arrays. Array's operations, Linear search, Binary search, sorting algorithms: insertion, bubble and selection sort.

UNIT - III

STACKS AND QUEUES: The Stacks: Definition; Array based implementation of stacks; Linked List based implementation of stacks; Examples: Infix; postfix; prefix representation; Conversions; definition of Queues; Array based implementation of Queues.

Section - B

UNIT - IV

LINKED LISTS: Linked List implementation of stacks and queues; Circular implementation of Queues and Singly linked Lists; implementation of doubly linked Queues; Priority Queues

UNIT - V

TREES and graph: Definition of trees and Binary trees; Properties of Binary trees and Implementation; Binary Traversal pre-order; post order; In- order traversal; Binary Search Trees. Introduction of Graph

UNIT – VI

File Structure

Physical storage devices and their characteristics, constituents of a file viz.Fields, records, fixed and variable length records, primary and secondary keys; File operations, Basic file system operations, File Organizations serial sequential, Indexed sequential, Direct, inverted, multilist, Hashing functions and collision handling methods

TEXT BOOK

Data & file structure, Schaum's series, varsha M Patil TMH.

DATA STRUCTURES USING C , E. Balagurusamy1/ED 1st Edition

Data structures *A Programming Approach with C*, D.S.Kushwaha and A.K.Misra, *PH I*.

REFERENCE BOOKS

Data & file structure, Sushil Goyal.

CAP-112-A	Data Structure Lab	L	T	P	Cr
		0	0	3	2

(For B. Sc Computer Science)

Objective: To understand the concepts of various data structures.

List of Experiments:

Note: C can be used to implement the following programs.

1. Write a program to calculate sum of n numbers using 1D array.
2. Write a program to find the transpose of a matrix.
3. Write a program to multiply two matrices.
4. Write a program to calculate factorial of a number using recursion.
5. Write a program to search a number in an array using linear search.
6. Write a program to search a number in an array using Binary search.
7. Write a program to implement insertion sort.
8. Write a program to implement stack using array.
9. Write a program to implement queue using array.
10. Write a program for implementation of creation, insertion, deletion, and searching operation in singly linked list.
11. Write a program to implement stack using linked list.
12. Write a program to implement queue using linked list.
13. Write a program to implement circular linked list.
14. Write a program for implementation of creation, insertion, deletion, and searching operation in doubly linked list.
15. Write a program to traverse a binary tree in preorder, postorder and inorder.

CAL-113-A	Fundamentals of Information Technology and C Programming	L	T	P	Cr
		4	0	0	4

For B Sc (Information Technology)

Objective:

To have a fundamental understanding of the design, performance and state of the art of Internet. Topics covered include state of the art E-mail, Internet and C programming.

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SECTION – A

UNIT- 1

Computer Block diagram, Applications , Introduction to World Wide Web, Surfing & searching the www: Directories search engines and Meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP. Browser architecture & types, HTTP, URL, Web page types, Using Plug-ins. User generated Content: Blogs & Wikis, HTML.

UNIT-2

E-Mail Concepts – Configuring E-Mail Program, Sending and Receiving Files through E-Mail, Fighting Spam, Sorting Mail, and avoiding E-Mail viruses. E-Mail mailing lists, Voice and Video conferencing

UNIT –3

C basics: C Character Set, Identifiers And Keywords, Data Types, Constants, Variables, type of variable and Arrays, Declarations, Expressions Statements, Symbolic Constants, Compound Statements.

SECTION – B

UNIT – 4

Operator: Arithmetic Operators, Unary Operators, Relational And Logical Operators, Assignment Operators, Conditional Operators, Bit Operators.

UNIT – 5

C constructs: If statement, if...else statement, if....else if...else statement, while statement, do...while statement, for statement, switch statement, nested control statement, break operator, continue operator, goto statement return statement.

UNIT – 6

C Functions: Definition of function, purpose, importance, declaration, recursion, call by value, call by reference type of function.

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CAP-113-A	Programming Lab	L	T	P	Cr
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For B Sc (Information Technology)

Objective:

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- 5- Program to demonstrate the implementation of one dimensional array and its various operations
- 6- Program to demonstrate the implementation of two dimensional arrays and its various operations
- 7- Program to demonstrate the implementation of pointers and its arithmetic's
- 8- Program to demonstrate the implementation of call by reference and call by value mechanism.