

Course No. : BS-COMP 111 Course Title : Computer Programming and Data Structures
Semester:- I Credits : 2 (1+ 1)

Theory

Introduction to high level languages i.e. C Language, Primary data types and user defined data types, Variables, typecasting, Operators, Building and evaluating expressions, Standard library functions, Managing input and output, Decision making, Branching, Looping, Arrays, User defined functions, passing arguments and returning values, recursion, scope and visibility of a variable, String functions, Structures and union, Pointers, Stacks, Push/Pop operations, Queues, Insertion and deletion operations, Linked lists.

Practical

Familiarizing with Turbo C IDE; Building an executable version of C program; Debugging a C program; Developing and executing simple programs; Creating programs using decision making statements such as if, go to & switch; Developing program using loop statements while, do & for; Using nested control structures; Familiarizing with one and two dimensional arrays; Using string functions; Developing structures and union; Creating user defined functions; Using local, global & external variables.

Teaching Schedule with weightages (%)

Sr.No.	Unit	Topic	Lecture No.	Weightage to topics
1	I	Introduction to high level languages i.e. "C" language. Basic structure of C program, Character set, Variables, Constants	1, 2	30%
2		Data types: Primary data types and user defined data types, typecasting	3, 4	
3		Operators: Arithmetic, Logical, Relational, Building and evaluating expressions, Standard library functions	4, 5	
4	II	Managing input and output : Input/ Output statement, scanf(), printf(), getchar(), getch(), putchar()	5, 6	30%
5		Decision making, Branching, Looping:- Conditional statements: if, if-else, nesting of if, if-ladder. Looping statement: while(), do .. while() and for() –looping statements	7,8	
6	III	Arrays : One dimensional, two dimensional and multi dimensional arrays	9	20%
7		Functions: Library Functions, User defined functions, passing arguments and returning values, recursion	10,11	
8	IV	String functions: strcat(), strlen(), strcpy(), strcmp() etc.	12,13	20%
9		Data structures: Structures, Union and Pointers (Syntax and definition)	14	
10		Stacks, Push/Pop operations, Queues, Insertion and deletion operations, Linked lists.	15,16	
Total Theory Marks (40)				100%

Practical Exercises

Sr. No.	Name of the Experiment
1	Write a program to check odd or even number. Write a program to find the largest among two numbers.
2	Write a program to find the Area of Circle, by giving radius as input.
3	Write a program to find the square root of a given number. Write a program to find the roots of quadratic equation $AX^2+BX+C=0$
4	Write a program to find the right most digit of a given number.
5	Program to calculate the simple interest by giving, principal amount, rate of interest and period in months.
6	Write a program to convert number of days in to months & days.
7	Write a program to find the largest of three given numbers A, B, C.
8	Write a program to find the average/mean of given 10 numbers.
9	Write a program to print the following triangle. 1 12 123 1234
10	Write a program a program to generate the Fibonacci series up to given numbers N.
11	Write a program to print the given number in reverse order.
12	Write a program to find the sum of first fifty even numbers.
13	Write a program for addition, subtraction and multiplication of 3x3 matrix.
14	Write a program to arrange the given 10 numbers using selection sort method.
15	Write a program to determine if the given number is prime or not prime.
16	Write a program to find the factorial of a given number using function.

Suggested readings

Text and Reference books

Rajaraman V. 1985. Computer Oriented Numerical Methods. Prentice Hall of India. Pvt. Ltd., New Delhi.

Balagurusamy E. 1990. Programming in 'C'. Tata McGraw Hill Publishing Co. Ltd., 12/4 Asaf Ali Road, New Delhi.

Rajaraman V. 1995. Computer Programming in 'C'. Prentice Hall of India Pvt.Ltd., New Delhi.

Bronson G and Menconi S. 1995. A First Book of 'C' Fundamentals of 'C' Programming. Jaico Publishing House, New Delhi

Sahni S.. Data Structures, Algorithms and Applications in C++. University press (India) Pvt Ltd / Orient Longman Pvt. Ltd.

Michael T. Goodrich, R. Tamassia and D Mount. Data structures and Algorithms in C++. Wiley Student Edition, John Wiley and Sons.

Mark Allen Weiss. Data Structures and Algorithm Analysis in C++. Pearson Education.

Augenstein, Langsam and Tanenbaum. Data structures using C and C++. PHI/Pearson Education.

Drozdek Adam. Data Structures and Algorithms in C++. Vikas Publishing House / Thomson International Student Edition.

Agarwal, Ajay. The Complete Reference Guide: Data Structure through C. ISBN: 8178840448; Publisher: Cyber Tech Publications.