Subject Code: 01CE0101

Subject Name: Computer Programming

B.Tech. Year - I

Objective: Students are expected to learn basics of Computer Programming which will help them to apply these concepts in day to day life. The course discusses various notations that required for developing algorithm and for C language, which is used in many commercial, industrial as well as industrial applications. Keeping in view wide applications of files, a special unit of files is introduced.

Credits Earned: 4 Credits

Course Outcomes: After completion of this course, student will be able to
- Recognize importance of C language and its day to day applications.

- Analyze the various control structures that requires to use in real time applications

- How to convert real time applications into algorithms and device the program using C language notations

- Identify various basic programming principles using C language.

- Illustrate various programming syntax.

- Express and distinguish various loops in C language.

- Express programming problems logically through flow charts and algorithms.

- Prepare effective team-oriented problem solver as well as communicator with non-technical stakeholders in computer and software systems development.

- Apply fundamental principles of problem solving in software engineering.

Pre-requisite of course: NA.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA	CSE	Viva (V)	Term work (TW)	
3	0	2	4	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	**Introduction :** Basic organization of a Computer, Languages Low level – high Number level, System – Binary – Decimal conversion problems, Flowchart, Algorithm, problem solving using flowchart and algorithm	6
2	**C Programming Basics :** Introduction to C Programming, Structure of 'C' program, compilation and linking processes, Constants, Variables, Data Types, C Tokens, Expression using operators in 'C', Type Conversion and Type Casting	7
3	**Control Structure and Looping :** Decision Making statements, Switch statement, Conditional operator, Looping – Entry and Exit control loops, concept of jump, break and continue.	6

4	**Array and String :** Declaration and initialization of array, Types of array, sorting and matrix operation using array, String – string operations, string array, string function	5
5	**Functions and Pointers :** Functions – Definition of function, Declaration of function, Call by value, Call by references, Recursion. Pointers – Definition, Initialization, pointer arithmetic, pointer and array, Chain of pointer.	8
6	**Structure and Union :** Need of structure data type, structure definition, structure declaration, structure within structure, difference between structure and union.	2
7	**Dynamic Memory Allocation :** DMA concepts, DMA functions – Malloc(), Calloc(), Realloc(), Free().	2
8	**File Management :** Introduction to file management and its functions.	3
9	**Introduction to Data Structure using C :** Introduction, Types - Linear and Non Linear Data structure Linear – Basics of Stack, Queue and Linked List	3
	Total Hours	**42**

References:

1. Programming in ANSI C by Balaguruswamy
2. Programming With Ansi And Turbo C book : Ashok Kamthane
3. Programming in C Ansi standard, by Yashwant Kanetkar
4. Programming with C, Gottfried, McGraw-Hill.

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process.

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyse	Evaluate	Create
20%	20%	30%	15%	10%	5%

Suggested List of Experiments:

1. Write a program to print student detail.

2. Write a program to calculate simple interest.

3. Write a program that accepts centigrade and convert it into Fahrenheit.

4. Write a program that accepts two numbers in A and B interchange value of A and B variable.

5. Write a program to demonstrate the use of the basic data types int, char and float.

6. Write a program to demonstrate the use of Arithmetic operators by getting two numbers from the user

7. Write a program that accepts a number from keyboard and find weather the number is ODD or EVEN using Conditional operators.

8. Write a program to demonstrate the use of increment and decrement operator.

9. Write a program to demonstrate the use of shorthand operators.

10. Write a program to demonstrate the use of sizeof() of operator.

11. Write a program to demonstrate the use of bitwise operators.

12. Write a program that accepts three numbers from the user and print maximum of them.

13. Demonstrate the use of GOTO statement.

14. Write a program to input the Name and the Salary of an Employee. Calculate and print the Name, Salary and Bonus of the Employee, where bonus= 5.3% if salary is at least Rs. 10,000 and 6.5% otherwise.

15. Admission to professional course is subject to the following conditions. Marks in Mathematics>=60

    Marks in Physics>=50 Marks in Chemistry>=40

    Total in all three subjects>=200 or total in mathematics and physics>=150 Given the marks in the three subjects, Write a program to process the application to list the eligible candidates.

16. Write a program that accepts two numbers and one code (1,2,3,4) from the user. According to the code, the operations to be performed, using switch case statements as follows: (Code : 1→ Addition, 2→ Subtraction, 3→ Multiplication, 4→ Division).

17. Write a program that reads the marks for five subjects of a student. Calculate and print the grade for the student [i.e. Grade A,B,C,D and F] using Else-If ladder.

18. Write a program that do sum=1+3+5+.......N terms Print value of Sum.

19. Write a program to print the Fibonacci Series[i.e 1,1,2,3,5,8,13...N terms].

20. Write a program to accept one number from the user. i) Display reverse of that number. ii) Find if it is Armstrong or not.

21. Write a program that accepts a number from the user and print prime numbers from 0 to that number.

22. Write a C program to display following different Patterns.

1	1
1 2	1 0
1 2 3	1 0 1
1 2 3 4	1 0 1 0

1 2 3 4 5	1 0 1 0 1

1 2 1 1 2 3 2 1 2 3 4 3 2 1 1 2 3 4 5 4 3 2 1	a b c d e f g h i j k l m n o
1 A B 1 2 3 A B C D 1 2 3 4 5	1 A B 2 3 4 C D E F 5 6 7 8 9

23. Write a program to accept 5 numbers in an array and display it.

24. Write a program to accept 9 numbers in form of matrix and display in matrix form.

25. Write a program to accept 5 numbers in array and find maximum and minimum value of it.

26. Write a program to accept 5 numbers in array and find maximum and minimum value of it.

27. Write a program to sort all elements of 1-D array in ascending and descending order.

28. Write a program to calculate and display addition of two matrix.

29. Write a program to count number of vowels in a given string.

30. Write a program to check whether entered string is palindrome or not.

31. Write a program for string concatenation without using library function.

32. Write a program to demonstrate the Library function for string.

33. Write a function which receives number as argument and return sum of digit.

34. Write a program for calculating Fibonacci series using UDF and call by value

35. Write a program to calculate Factorial using recursion in UDF.

36. Write a program to find Average, maximum and minimum of Array elements using UDF.

37. Write a program to calculate total number of positive, negative and zero value in array using UDF.

38. Write a program to swap two numbers using UDF and pointer.

39. Write a program using pointer to read in an array of integers and print its elements in reverse order.

40. Write a C program to create a structure of employees with Full Name, Last Name,City and Salary. Display it for n employees.

41. Write a program to demonstrate nested structure.(make structures for circle and rectangle)

42. Write a program to create array of structure. Make a structure for student having student_no, student_name, student_marks.

43. Write a program to create union cricketer having player_name, batting_avg, player_age.P for swapping of two values with help of UDF and call by reference.

44. Write a program to Display contents of a file on screen. Use functions (fopen,fclose, getc,putchar,eof)

45. Write a program to count number of characters in a file.

Instructional Method:

a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources

1. http://nptel.ac.in/courses/106104128/

2. http://nptel.ac.in/courses/106106133/

3. http://nptel.ac.in/courses/106104128/

4. http://vlab.amrita.edu/index.php

5. http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-087-practical-programming-in-c-january-iap-2010/