Semester	**:**	**II**			
Course No.	**:**	**COMP-122**	**Credit Hrs.**	**:**	**2(0+2)**
Course Title	**:**	**Computer Programming and Data Structures**			

SYLLABUS

Objective : To make the students conversant on computer programming languages, specifically "C" language as well as to make them familiar with programming for simple agricultural engineering applications.

PRACTICAL

Introduction to high level languages; Structure programming, C programming, a simple C programming, execution of a C program, program and instruction; Familiarizing with Turbo C IDE. Building an executable version of C program; Study of different operators such as arithmetic, relational, logical, assignment, increment and decrement, conditional, bitwise and special operators, precedence of arithmetic operators; Debugging a C program; Developing and executing simple programs; Creating programs using decision making statements such as if, go to and switch; Developing program using loop statements while, do and for; Using nested control structures; Familiarizing with one- and two-dimensional arrays; Using string functions; Creating user defined functions; Developing structures and union; Using local, global and external variables; Using pointers. Developing linked lists in C language; Inserting an item in Linked List; Deleting an item in Linked List; Implementing Stacks; Implementing push/pop functions; Creating queues, Insertion/ Deletion in queue.

TEACHING SCHEDULE

PRACTICAL [COMP-122]

Exercise No.	Exercise Topic
1	Introduction to high level languages C: - structure programming, C programming, a simple C programming, execution of a 'C' program, program and instruction; Familiarizing with Turbo C IDE
2	Write a 'C' language program to calculate the sum and average value of given number.
3	Write a 'C' language program for application of if statement a) Write a 'C' language program to find odd and even numbers. b) Write a 'C' language program to read the integer number and find the ratio.
4	Write a 'C' language program to calculate roots of quadratic equation. $Ax2+Bx+C=0$. Write a 'C' language program to find the largest of three values. Write a 'C' language program to evaluate power series. $ex=1+x+x^2/2!+x^3/3!+\ldots\ldots\ldots+xn/n!$
5	Write a 'C' language program to find factorial of given number; Write a 'C' language program for power table of 2 to 3.
6	Write a 'C' language program to sort list & find its median.
7	Write a 'C' language program for calculation of standard deviation.
8	Write a 'C' language program to calculate the average of student exam score.
9	Write a 'C' language program for temperature conversion Fahrenheit-Celsius table.
10	Write a 'C' language program for evaluation of binomial coefficient.
11	Write a 'C' language program for matrix. a) Addition c) Subtraction b) Multiplication d) Transpose Inverse
12	Write a 'C' language program for prime number.
13	Write a 'C' language program for creating linear link list.
14	Write a 'C' language program for menu driven sorting techniques: a) Bouble sort c) Quick sort b) Merge sort d) Bucket sort
15	Write a 'C' language program for structure & structure members.
16	Write a 'C' language program for data structure: a) Display Structure c) Addition of Structure b) Deletion of Structure d) Searching of Structure
17	Write a 'C' language program for simulation of craps game.
18	Write a 'C' language program for link list node insertion & node deletion function.
19	Write a 'C' language program for "Calculating and storing the areas of several circles.
20	Write a 'C' language program finds "Binomial coefficient (NCR).
21	Write a 'C' language program "To determine roots of algebraic equation using iterative procedure.

Continued…

22	Write a 'C' language program for "the TOWERS OF HANDI".
23	Write a 'C" language program for "To find the maximum of a function within a specified format.
24	Write a 'C' language program "To sort a list of string alphabetically using a two-dimensional character array.
25	Write a 'C' language program for cox formula.
26	Write a 'C' language program for Elision formula.
27	Write a 'C' language program for adjusting soil loss.
28	Write a 'C' language program to design Bisal formula.
29	Write a 'C' language program to design horizontal interval for bench terrace.
30	Write a 'C' language program for Bycyuos formula for erodibility.
31	Write a 'C' language program for Dickens's formula.
32	Write a 'C' language program to design runoff rate.

Suggested Readings [COMP-122]:

1. Rajaraman V. 1985. Computer Oriented Numerical Methods. Prentice Hall of India. Pvt. Ltd., New Delhi.
2. Balagurusamy E. 1990. Programming in 'C'. Tata McGraw Hill Publishing Co. Ltd., 12/4 Asaf Ali Road, New Delhi.
3. Rajaraman V. 1995. Computer Programming in 'C'. Prentice Hall of India Pvt. Ltd., New Delhi.
4. Bronson G and Menconi S. 1995. A First Book of 'C' Fundamentals of 'C' Programming. Jaico Publishing House, New Delhi.
5. Sahni S. 2006. Data Structures, Algorithms and Applications in C++. University Press (India) Pvt. Ltd / Orient Longman Pvt. Ltd.
6. Goodrich M.T., Tamassia R and Mount D. 2011. Data Structures and Algorithms in C++. Wiley Student Edition, John Wiley and Sons.
7. Weiss M.A. 2007. Data Structures and Algorithm Analysis in C++. Pearson Education.
8. Augenstein L and Tanenbaum. 2003. Data Structures using C and C++. PHI/Pearson Education.
9. Drozdek A. 2012. Data Structures and Algorithms in C++. Vikas Publishing House/ Thomson International Student Edition.
10. Agarwal A. 2005. The Complete Reference Guide: Data Structure through C. ISBN: 8178840448; Publisher: Cyber Tech Publications. C language 60 program (Flow chart, Algorithm, code, o/p)
11. Chapman W.A. J 2018. Workshop Technology (Vol. I and II) Arnold Publishers (India) Pvt. Ltd., New Delhi.
12. Hajra Choudhari, S.K. Roy N, Hajra Choudhary A.K. 2017. Elements of Workshop Technology (Vol. I and II) Media Promoters and Publishers Pvt Ltd, Mumbai.
13. Khurmi R.S. and Gupta J.K. 2018 A test book of Workshop Technology. S. Chand and Company Ltd. New Delhi
14. Raghuwanshi B.S. 2016. A Course on Workshop Technology (Vol. I and II). Dhanpat Rai and Sons, New Delhi.