FACULTY OF ENGINEERING AND TECHNOLOGY
First Year Bachelor of Technology
In Effect from Academic Year 2020-21

Subject Code: 1ET1000110	Subject Title: INTRODUCTORY COURSE IN COMPUTER PROGRAMMING
Pre-requisite Subject:	---

Course Objective:
Each faculty of engineering & technology is profoundly computational. Simulations, data analysis &processing are a significance part of most of the engineering streams. This course is intended to develop problem solving skills in to students with basics of programming. Student is expected to learn problem solving using algorithm & flowchart techniques and implementation of problem using 'C' programming. This course shall also put a foundation stone for the computerized problems solving simulation tools such AutoCAD, MATLAB, Pro-E and many others.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory		Practical		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total
4	-	2	5	70	30	-	20	120

Subject Contents			
Sr. No	**Topic**	**Total Hours**	**Weight (%)**
1	**Problem Solving Techniques:** What is Problem Solving? Classic Puzzles, Problem Solving Techniques: Always have a pen, Restate the Problem, Divide the Problem , Start with What you know, Reduce the Problem, Look for Analogies, Experimental Approach	5	10
2	**Algorithm and Flowchart** **Algorithm:** Introduction, Syntax/Semantics. Writing Techniques. Algorithm writing with simple problems. Importance of Algorithm. **Flowchart:** Definition and Importance of Flowchart, Flowchart Symbols, Guidelines for preparing flowchart, Flowchart Structures – Sequence, Selection, Repetition.	4	8
3	**Getting started with Programming in C:** Introduction to Programming in C. History of C. General Structure of "C" Program. Standard Header files. Features of C. C Tokens, Keywords and Identifiers. Constant and variables in C. Data Types, Variables (Declaration,Initialization, Dynamic, Basic IO Operation in C Initialization),Conversions(Explicit-Implicit Conversions),Debugging C Program. Write your first C program.	5	10
4	**Operators in C:** Types of operators and their symbolic representation, Comma and conditional/turnery operator, Arithmetic operators, Inc/Dec operator, Relational operators, Assignment operators and expressions, Logical operators,Bitwise operators,Properties of operator, Priority of operator and their clubbing.	4	8
5	**Manage & Formatting Input /Output:** Reading and Writing Characters and Strings, Formatted Input and Formatted Output	4	8
6	**Decision Making Statements:** Conditional Statements, Unconditional branching: gotostatement, Conditional branching statements: If statement,If-else statement, Nested If-else statement, If-else-if ladder statement, break, continue and gotostatements, switch statements	8	16
7	**Looping Structures:** Introduction to Looping Structures, Categories of Loops, Types of Loops, for loop, while loop, do while loop, nesting of loops.	6	12

8	**Fundamentals of Arrays:** Introduction to Arrays, Array Terminology and types of Arrays, Characteristics of Array,Array declaration, Array initialization, Accessing array elements, Sorting/Searchingoperations on array elements, Two dimensional & multi-dimensional array declaration and initialization, String manipulation operation using arrays, Built in String functions.	6	14
9	**Functions:** Introduction to User defined function (UDF), Function declaration, Function definition, Functioncall, Categories of user define function, Passing Array as parameter, Nesting of function, Recursion, Usage of built-in mathematical function and implementing the same using UDF. Creating and using user-defined header files.	6	14

Course Outcome:
At the end of this course, the student would be able

- To understand the methods of problem solving
- To have fundamental knowledge on flowcharts and algorithms
- To formulate the problem and express the same using flowcharts and algorithms
- To understand the basic terminology used in computer programming using C
- To study, analyze and understand logical structure of a computer program, and different construct to develop a program in 'C' language
- To write, compile and debug programs in C language
- To design programs involving decision structures, loops and functions

List of References:

1. Programming in ANSI C – E Balagurusamy, TMH publication.
2. Let us "C" – KanetkarYashwant, BPB Publication.
3. Think Like a Programmer- V. Anton Spraul ,No starch Press

e-Resource:

1. https://books.google.co.in/books?id=r6XiBUBERG8C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
2. http://www.cprogramming.com/

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

Sr.No	Practical Exercise
1.	1.1 FOX, Goose and Cone Puzzle 1.2 Sliding Puzzle 1.3 Sudoku
2.	**Draw a Flow chart and write an Algorithm for Following Problems**. 2.1 Write an algorithm and flowchart for calculating the difference, and the quotient the product of Two given numbers. 2.2 Write an algorithm and flowchart for converting centimeters to meters. 2.3 Write an algorithm and flowchart for finding maximum from 3 numbers. 2.4 Write an algorithm and flowchart for finding sum of N Numbers. 2.5 Write an algorithm and flowchart for Solving Quadric Equation.

3.	**Usage of Operators (Part-I)** 3.1 Write a C program to print "Hello C!" 3.2 Write a C program to demonstrate Simple calculations. 3.3 Write a C program to demonstrate use of simple variables. 3.4 Write a C program for demonstrating constant. 3.5 Write a C program to use symbolic constant. 3.6 Write a C Program to Find Quotient and Remainder of Two Integers Entered by User. 3.7 Write a C Program that demonstrates implicit and explicit conversion. 3.8 Write a C Program to swap two numbers.
4	**Usage of Operators (Part-II)** 4.1 Write a C Program to make Simple Calculator. 4.2 Write a C Program to Solve Quadric equation. 4.3 Write a C Program to convert days in to month and year. 4.4 Write a C program to make simple grade sheet which makes total of given subjects marks and find percentage. 4.5 Write a C Program to find simple interest. 4.6 Write a C Program to Calculate Area of • Circle • Scalene Triangle • Equilateral Triangle • Right angle Triangle • Rectangle • Square • Parallelogram • Rhombus • Trapezium
5	**Input / Output** At least 5 Programs demonstrating formatted input output using various data types and their identifiers.
6.	**Decision Making Statements** 6.1 Write a C Program to find maximum and minimum of three numbers. 6.2 Write a C Program to check given number is even or odd. 6.3 Write a C Program to check weather year is leap year or not. 6.4 Write a C Program to make choice based Simple Calculator. 6.5 Write a C Program to find given number is negative, positive or zero. 6.6 Write a C Program to demonstrate forward jump using goto statement. 6.7 Write a C Program to demonstrate backward jump using gotostatement. 6.8 Write a C Program to demonstrate switch case statement. 6.9 Write a C Program to demonstrate ATM transaction (money withdrawal). 6.10 The distance between two cities (In KM) is input through key board. Write a program to convert and print this distance in meters, feet, inches& centimeters.
7.	**Looping Structures** 7.1 Write a program to display multiplication table. 7.2Write a program to find sum of all integers greater than 100 & less than 200 and are Divisible by 5. 7.3 Write a program to evaluate following series. • 1+2+3+4+5+…..+N • 1+3+5+7+……..+N • 1-2+3-4+5-6+……..±N • 1 + 1/2 + 1/3 + 1/4 +……+ 1/N

	• $1^2 + 2^2 + 3^2 + \ldots\ldots\ldots + N^2$ 7.4 Write a C Program to find factorial numbers using Loop. 7.5 Write a C Program to reverse given numbers. 7.6 Write a C program to (a) count digits (b) find sum of digits of a given number. 7.7C program to convert each digits of a number in words 7.8Write a C program to print Fibonacci series of given range 7.9 Write a C program to prepare a currency converter. 7.10 Write a c program to check given number is • perfect number or not • Armstrong number or not • Prime number or not • Strong number or not • Odd or even • Palindrome number or not 7.11 Write a c program to print • Floyd's triangle • Pascal triangle • Multiplication table 7.12Write a C Program for following Patterns. * 1 2 3 4 5 AAAAA 1 * * 2 3 4 5 BBBB 0 1 * * * 3 4 5 CCC 1 0 1 * * * * 4 5 DD 0 1 0 1 5 E
8.	**Arrays** 8.1 Write a C Program to make sum of 10 numbers using an Array. 8.2 Write a C Program to find maximum of given array elements. 8.3 Write a C Program to make addition of two arrays' elements. 8.4 Write a C Program to scan and print two dimensional array elements. 8.5 Write a C Program to search an element from an array. 8.6 Write a C Program to sort array elements in ascending and descending order. 8.7 Write a C Program to delete specific element from array elements. 8.8 Write a C Program to make matrix multiplication of two 3*3 matrixes.
9.	**Functions** 9.1 Write a C Program and make Function to Convert Fahrenheit to Celsius. 9.2 Write a C Program and make Function to Find Sum and Average of three Numbers. 9.3 Write a C Program and Make Function for each operation of Simple Calculator. 9.4 Write a C Program and make recursive function for Factorial. 9.5 Write a C Program and that demonstrate use of nesting of Function. 9.6 Write a C program to create and include user-defined header files.