CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

Offered By Department of INFORMATION TECHNOLOGY

Semester 2nd (Major Course)

Course Title: Programming through C Language

Course Code: UGICT22J201 **Max. Marks 100**
Credits: 4 (Theory: 3, Practical: 1) **Theory External: 60; Min Marks: 24**
Contact Hrs: 75 (Theory: 45, Practical: 30) **Theory Internal (Continuous Assessment): 15 Marks, Min Marks: 06**
Practical Experimental Basis= 15, Min. Marks: 06
Practical Experimental (Continuous assessment) = 10, Min. Marks: 04

Objectives: The main objective of this course is to impart basic and advanced concepts to the students about programming through C language including problem solving techniques, fundamentals of C programming language, decision making and looping statements, pointers and file handling.

Learning outcomes:
After completion of the course student should be able to:
1. Create flow-charts, algorithms for various problems.
2. Understand the basic syntax and semantics of C language.
3. Write programs using various input and output operations.
4. Implement decision-making and looping constructs.
5. Implement 1-D, 2-D arrays and operations on arrays.
6. Implementing functions: inbuilt and user-defined using programs in C.
7. Create and use pointers and perform various pointer operations.
8. Implement error handling in C.

UNIT-I **15 Hrs**

Introduction to Problem solving: Steps in problem solving, The Basic Model of Computation, Flow-Charts, Algorithms, Flowcharts and Algorithms for various problems, Introduction to Programming Languages.
Fundamentals of C Programming Language-History of C Programming, character set, Identifiers and keywords, Data Types, Constants and Variables, C Declarations, Expressions, Library functions, Introduction to macro-processing: symbolic constants. Basic structure of a C program. Steps involved in executing a C program.
Operators and Expressions- Unary, Binary and Ternary operators, Arithmetic operators, Relational operators, Logical operators, Bitwise operators, Conditional operator. Arithmetic Expressions, Evaluation of Expressions, Conversion and casting, Operator Precedence and Associativity.
Storage Class in C- Automatic, Register, static, external. Scope visibility and lifetime of variables.
Managing Input and Output Operations: Input and output functions in C : getchar, putchar, gets, puts, scanf, printf.

UNIT-II **15 Hrs**

Decision making and branching- Introduction, Decision Making with IF Statement, Simple IF Statement, the IF-ELSE Statement, Nesting of IF-ELSE Statements, The ELSE IF Ladder, The Switch statement, The ? : Operator, The goto statement.
Working with looping constructs in C- Introduction, The while Statement, The do statement, The for statement, Jumps in loops, continue and break statement.
Arrays- Arrays, One dimensional array, Array operations, Two dimensional arrays, working with matrices.
Functions- Defining a function, function arguments, function prototype, recursion, passing array to a function, The Scope, Visibility and Lifetime of variables, command line arguments.

UNIT-III **15 Hrs**

String handling : Declaring and Initializing String Variables, Reading Strings from Terminal, Writing Strings to Screen, String-handling Functions : strcpy, strcat, strlen, strcmp etc.
Pointers –Introduction, Pointer declaration, Initialization of Pointer variables, accessing a Variable through its Pointer, pointer arithmetic, passing pointer to a function, call by value and call by reference, pointer and one-dimensional arrays, array of pointers. Introduction to dynamic memory allocation.
Structures and Unions- User defined data types, defining a structure, accessing structure members, array of structures, sorting structures, passing structure to a function. concept of union, working with union.
Introduction to File Handling - Introduction, opening and closing a file. Input/output operations on files, Error handling on files, Sequential and Random access file, working with files in binary mode : fwrite(), fread().

PRACTICAL **30 Hrs**
UNIT IV

Implementing the following using C programs: C data types, variables, constants, operators and expressions, storage classes, input and output operations, decision making and branching statements, looping constructs, 1-D array, 2-D array, array operations, working with matrices, in-built and user-defined functions, string handling-functions, pointer handling, structures, unions and file handling.

Recommended Books:

1. “Programming in C” by Schaum Series (Mcgraw Hill)
2. “Let Us C” by Yashwant Kanitkar, BPB Publications
3. “Programming in ANSI C” by E. Balaguruswamy, Tata McGraw Hill
4. “Art and Craft of C” by R.B. Patel.
5. “The C Programming Language” 2nd, Edition by Brian W. Kernighan &Dennis Ritchie Pearson