

## Semester: I

Course Code: DSC-1	<b>Course Title: Computer Fundamentals and Programming in C</b>
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02

### Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Confidently operate computers to carry out computational tasks
- Understand working of Hardware and Software and the importance of operating systems
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C
- Write programs that perform operations on arrays, strings, structures, unions and functions

### Course Content

Content	Hours
<b>Unit - 1</b>	
<b>Fundamentals of Computers:</b> Introduction to Computers - Computer Definition, Characteristics of Computers, Evolution and History of Computers, Types of Computers, Basic Organisation of a Digital Computer; Number Systems – different types, conversion from one number system to another; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples. <b>Introduction to C Programming:</b> Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C. <b>C Programming Basic Concepts:</b> C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.	13
<b>Unit - 2</b>	
<b>Input and output with C:</b> Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control stings and escape sequences, output specifications with <i>printf</i> functions; Unformatted I/O functions to read and display single character and a string - <i>getchar</i> , <i>putchar</i> , <i>gets</i> and <i>puts</i> functions. <b>C Operators &amp; Expressions:</b> Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion.	13

<b>Unit - 3</b>	
<p><b>Control Structures:</b> Decision making Statements - <i>Simple if, if_else, nested if_else, else_if ladder, Switch-case, goto, break &amp; continue</i> statements; Looping Statements - Entry controlled and Exit controlled statements, <i>while, do-while, for</i> loops, Nested loops.</p> <p>Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation.</p> <p>Strings: Declaring &amp; Initializing string variables; String handling functions - <i>strlen, strcmp, strcpy and strcat</i>; Character handling functions - <i>toascii, toupper, tolower, isalpha, isnumeric</i> etc.</p>	13
<b>Unit - 4</b>	
<p><b>Pointers in C:</b> Understanding pointers - Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays; Pointer Arithmetic; Advantages and disadvantages of using pointers;</p> <p><b>User Defined Functions:</b> Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.</p> <p><b>User defined data types:</b> Structures - Structure Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, comparing structure variables, Array of Structures; Unions - Union definition; difference between Structures and Unions.</p>	13

### Text Books

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals (Sixth Edition), BPB Publication
2. M.T Somashekara, D.S Guru and K.S. Manjunatha: Problem solving with C, PHI publication
3. E. Balgurusamy: Programming in ANSI C (TMH)

### References

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI – EEE)
3. S. ByronGottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)