

B.TECH. I Semester-1	L	T	P	C
CS 101: Fundamentals of Computer Programming	3	0	2	4

Unit – 1	12 Hours
<u>Basic Structure of Computers:</u> Introduction to Programming, history of computers, Functional Units of a Computer: Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit; Communication between various Units, Memory Hierarchy, Primary Memory and its Types, Secondary Memory, Classification of Secondary Memory, Various Secondary Storage Devices and their Functioning. <u>Overview of C Programming Language:</u> Flowchart, History of C, Importance of C, Basic Structure of a C Program, How to Compile a C Program, How to Run a C Program, Sample Programs. <u>Constants, Variables & Data Types:</u> Keywords, Identifiers, Constants, Strings, Operators, Special Symbols, Variables, Data Types: Primary Data Types and User Defined Data Types, Declaration of Variables, Assigning Values to Variables, Initialization of Variables, Defining Symbolic Constants, Declaring Variables as Constants. <u>Operators:</u> Arithmetic, Relational, Logical, Assignment, Increment and Decrement, Conditional, Bitwise, Comma Operator, sizeof Operator, Operators used in Pointers and Structures <u>Arithmetic Expressions:</u> Evaluation of Arithmetic Expressions, Precedence of Arithmetic Operators and Associativity Rule, Type Conversion: Implicit and Explicit. <u>Library Functions:</u> Reading Character from Keyboard, Printing Character on Screen, Reading String from Keyboard, Printing String on Screen, Formatting input and Output, clock, time, Math Functions: abs, fmod, remainder, log, log2, pow, sqrt, ceil, floor.	
Unit – 2	12 Hours
<u>Decision Making & Branching:</u> If Statement, Nested If Statement, Else .. If Ladder, Switch Statement, Conditional Operator Statement, Goto Statement, Decision Making with Logical Operators. <u>Looping:</u> Introduction to Loops, While Loop, Do While Loop, For Loop, Break Statement, Goto Statement, Continue Statement. <u>Arrays:</u> Introduction to Arrays, One Dimensional Array, Two Dimensional Array, MultiDimensional Array, Sample Programs, Declaration and Initialization of Strings, Arithmetic Operations on Characters, String Functions: Strlen(), Strcat(), Strcpy(), Strstr(), Strcmp(), etc.	
Unit – 3	10 Hours
<u>Functions:</u> Function Declaration, Function Definition, Function Calls, Functions with No Arguments and No Return Values, Functions with Arguments and No Return Values, Functions with No Arguments and Return Values, Functions with Arguments and Return Values, Recursive Functions, Passing Arrays to Functions, Call by Value, Call by Reference, Scope and Lifetime of Function variables: Local, Global, and Static. <u>Structure:</u> Structure Template, Structure Variable Declaration and Initialization, Structure Variable Assignment, Accessing Structure Variables, Arrays as Structure, Arrays with Structures, Passing Structure Members to Functions.	
Unit – 4	08 Hours
<u>Pointer & Memory Management:</u> Declaration and Initialization of Pointers, Accessing Memory through Pointers, Dynamic Memory Allocation, Memory Management Functions: Malloc, Calloc, and Free, Using Pointers to Access Dynamically Allocated Memory Locations, Pointers with Arrays, Use of Pointers to Return Multiple Values from Functions. <u>File Management:</u> Opening and Closing a File, Modes in File Opening: Read, Write and Append, Input and Output Operations on Files, File Handling Functions such as fseek(), ftell(), rewind().	
Total Contact Time: 42 Hours	

Recommended Books
1. "Programming in ANSI C", E. Balagurusamy, 8/E, Tata Mc-Graw Hill, 2012. 2. "Let us C", Yashavant Kanetkar, 20/E, BPB Publications, 2024 3. "The C Programming language", Brian W. Kernighan, Dennis M. Ritchie, 2/E, Prentice Hall PTR publication, 1988.

4. "Programming with C Schaum's outline Series", Gottfried B.S., Outline Series, 2/E, TMH, 2006.
5. "Programming in C", Pradip Dey, 2/E, Oxford University Press, 2012.
6. "Computer Organization and Embedded Systems", Carl Hamacher, 6th Edition, TMH.
7. "Introduction to Computer Science", IITL Education Solutions Limited, Pearson Education, Fourth Impression, 2009.