NIRMA UNIVERSITY

Institute of Technology

B.Tech., All Branches

Semester-I/II

L	T	P	C
2	1	2	4

Course Code	**CE104**
Course Title	**Computer Programming**

Course Learning Outcomes (CLOs):

At the end of the course, students will be able to –

1. demonstrate the importance and apply C language constructs in program development,
2. analyse the problem and select the most appropriate method to solve it,
3. evaluate the correctness of the developed solution.

Syllabus:

Teaching hours:

Unit I 3

Introduction to Computers: Introduction to Computers and the Internet in Industry and Research, The Internet and World Wide Web, web Resources, Hardware and Software, Computer Organization, Programming Languages, Introduction to the C Programming Language, Typical C Program Development Environment and steps. Test-Driving a C Application in Linux, Running a C program Using GNU for debugging.

Unit II 5

Introduction to Programming: Memory Concepts, datatypes, operators and expressions, Decision Making, Bitwise Operators, Flowchart, Algorithms, Pseudocode, Test-cases, Repetition Statement, Counter-Controlled Repetition, Sentinel-Controlled Repetition, Nested Control Statements. Introduction some Simple C Program, I/O handling.

Programming with C: keywords, syntax and library functions, datatypes, declarative, imperative and decision statements. Control structures.

Unit III 7

Functions: Math Library Functions, User defined functions, Function Call Stack and Stack frames, Passing Arguments by Value and By Reference, Scope Rules, Recursion, Recursion vs. Iteration.

Arrays: Defining Arrays, Sorting Arrays, Searching Arrays, Multidimensional Arrays, Variable-Length Arrays, Passing Arrays to Functions.

Unit IV 7

Pointers: Pointer Variable Definitions and Initialization, Pointer Operators, Passing Arguments to Functions by Reference, Pointer Expressions and Pointer Arithmetic, Relationship between Pointers and Arrays, Arrays of Pointers, Pointers to Functions. Introduction to dynamic memory allocation.
Characters and Strings: Fundamentals of Strings and Characters, Character-Handling Library Functions, String-Conversion Functions, Standard Input/Output Library Functions for string, String-Manipulation Functions of the String-Handling Library, Comparison Functions of the String-Handling Library.

Unit V 8

Structures: Structure Definitions, Defining Variables of Structure Types, Operations That Can Be Performed on Structures, Initializing Structures, Accessing Structure Members, Using Structures with Functions
File Processing: Files and Streams, Creating a File, Reading and writing Data from a File.

Self-Study:
The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory Work:
Above concepts are to be implemented in C-language atleast with emphases on logic development and debugging, 10 experiments are to be carried out.

Tutorial Work:
The tutorial work will be based on the topics covered in the syllabus. Minimum 10 tutorials should be carried out.

Suggested Readings^:

1. Kernighan., Ritchie, ANSI C Language, Prentice Hall of India
2. Deitel and Deitel , C How to Program, Pearson
3. E. Balagurusamy, Programming in ANSI C, McGraw Hill
4. E. Balagurusamy, Pointer in C, McGraw Hill
5. Yashwant Kanitker, Let Us C, BPB Publications
6. V. Rajaraman, Fundamentals of Computers, Prentice Hall of India
7. Sedgewick R., Algorithms in C, Addison Wesley

L= Lecture, T= Tutorial, P= Practical, C= Credit
^This is not an exhaustive list