



Syllabus for the Academic Year - 2020 - 2021

**Department: Computer Science and Engineering**

**Semester: I/II**

**Subject Name: Programming with Problem Solving**

**Subject Code: ES-CS105**

**L-T-P-C: 3-1-0-4**

**Course Objectives:**

| Sl No | Course Objectives   |
|-------|---|
| 1     | To impart adequate knowledge on the need of programming languages and Problem solving techniques.   |
| 2     | To develop programming skills using the fundamentals and basics of C Language.                      |
| 3     | To understand the effective usage of data types, operators, decision making and looping statements. |
| 4     | To enable effective usage of arrays, strings, functions, pointers, structures, Unions and files.    |

| UNIT | Description   | Hours |
|------|---|-------|
| I    | <p><b>Problem solving through algorithm, flowchart and pseudocode</b></p> <p><b>Introduction:</b> Writing Algorithms, Flowcharts and pseudo code for a given problem. Problem Formulation and Planning a Program, Structure of C program,</p> <p><b>Constants, Variables and Data Types:</b> Character Set, C-Tokens, Keywords and Identifiers, Constants, Variables, Data Types, Declaration of Variables, Defining Symbolic Constants, Declaring a Variable as Constant, Declaring a Variable as Volatile.</p> <p><b>Operators and Expressions:</b> Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators. Type Conversion in Expressions, Operator Precedence and Associativity. Example programs.</p> <p><b>Managing Input and Output Operations:</b> Unformatted and Formatted Input and Output statements. Example programs.</p> | 11    |



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|-----|--|----|
| II  | <b>Decision making: branching and looping</b><br><b>Decision Making and Branching:</b> Decision Making with Simple if Statement, if...else Statement, Nesting of if...else statements, else...if Ladder, switch Statement, goto statement. Example programs.<br><b>Decision Making and Looping:</b> Introduction, The while Statement, The do Statement, The for Statement, Jumps in Loops with break and continue statement. Example programs.                    | 11 |
| III | <b>Arrays and Strings</b><br><b>Arrays:</b> One-Dimensional Arrays - Declaration and Initialization of One-Dimensional Arrays, Two-Dimensional Arrays - Declaration and Initialization of Two-Dimensional Arrays.<br><b>Strings:</b> Declaring and Initializing String Variables, Reading and Writing Strings, Arithmetic Operations on Characters, String-Handling Functions, Table of Strings. Example programs  | 10 |
| IV  | <b>Pointers and Functions</b><br><b>Pointers:</b> Understanding Pointers, Accessing the Address of a Variable, Declaring Pointer Variables, Initialization of pointer Variables, Accessing a Variable through its Pointer.<br><b>Functions:</b> Need for User-Defined Functions, Elements of User Defined Functions, Category of Functions, Recursion, Passing Arrays to Functions, Passing Strings to Functions, The Scope, Visibility and Lifetime of Variables. | 10 |
| V   | <b>Structure, Union and File management</b><br><b>Structures and Unions:</b> Defining a Structure, Declaring Structure Variables, Accessing Structure Members, Structure Initialization, Arrays of Structures, Arrays within Structures, Structures within Structures, Structures and Functions, Unions, Example programs.<br><b>File Management:</b> Introduction, Defining and Opening a File, Closing a File, Input/output Operations on Files.                 | 10 |

**Text Books:**

| Sl No | Title                 | Author(s)       | Edition, Publisher, Year, ISBN  |
|-------|-----------------------|-----------------|---|
| 1     | Programming in ANSI C | E. Balagurusamy | 7th Edition, Tata McGraw-Hill Publication, 2017<br>ISBN-10: 933921966X<br>ISBN-13: 978-9339219666 |



**Reference Books:**

| <b>Sl No</b> | <b>Title</b>                          | <b>Author(s)</b>              | <b>Edition, Publisher, Year, ISBN</b>  |
|--------------|---------------------------------------|-------------------------------|--|
| <b>1</b>     | Schaum's outlines, Programming with C | Byron Gottfried               | 3rd Edition, Tata McGraw-Hill Publication, 2017.<br>ISBN-10: 0070145903<br>ISBN-13: 978-0070145900 |
| <b>2</b>     | C : How to Program                    | Paul Deffel and Harvey Deitel | 8 edition, Pearson, 2015.<br>ISBN-10: 9780133976892<br>ISBN-13: 978-0133976892                     |
| <b>3</b>     | Let us C                              | Yashwant Kanetkar             | 15th Edition, BPB Publication, 2016.<br>ISBN-10: 8183331637.<br>ISBN-13: 978-8183331630.           |

**Course Outcomes:**

| <b>Course outcome</b> | <b>Descriptions</b>   |
|-----------------------|---|
| <b>CO1</b>            | Identify, abstract the programming task and write flowchart/algorithm/pseudo code for the same. |
| <b>CO2</b>            | Choose the right data representation format based on the requirement of the problem.            |
| <b>CO3</b>            | Write the program, compile, debug and execute   |
| <b>CO4</b>            | Select right programming constructs for the given task.   |