# 20CS1101 - PROGRAMMING FOR PROBLEM SOLVING

(Common to all Branches)

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Category:** | Professional core | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3-0-0 |
| **Prerequisite:** | Knowledge on computer fundamentals and basic mathematics. | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | Students undergoing this course are expected to learn:* Learn the procedure how to develop algorithms, representations and programming development steps.
* Learn the basic building blocks of C language.
* Usage of C constructs (arrays, structures, pointers and file management) to develop various programs.
* Create better awareness how effectively utilize the concepts of C for application development
 |

|  |  |
| --- | --- |
| **Course Outcomes** | Upon successful completion of this course students will be able to: |
| CO1 | Learn the fundamentals of programming development, structure of C and basic data types. |
| CO2 | Find the usage of operators in expression evaluation and construction of I/O Statements. |
| CO3 | Acquire knowledge on various control structures to develop simple programs. |
| CO4 | Explore the concept of arrays, strings and its effective utilization. |
| CO5 | Understand the concepts of Pointers and Functions for exploring the dynamic memory usage. |
| CO6 | Explore the basics of Structures, Unions, File operations and supporting implementations. |
| **Course Content** | UNIT - I **INTRODUCTION**: Algorithms, Flow charts, Program development steps. **FUNDAMENTALS OF C**: History, Structure of a C program, Programming rules and execution. Character set, Delimiters, C keywords, Identifiers, Constants, Variables, Rules for defining Variables, Data types, Declaration and Initialization of Variables. UNIT - II **OPERATORS AND EXPRESSIONS:** Introduction, Operator Precedence and Associativity, Operator Types **INPUT AND OUTPUT IN C:** Formatted and Unformatted functions, Commonly used library functions. UNIT - III **DECISION STATEMENTS:** Introduction, Types of If statements, switch statement, break, continue, goto.2 Course Content.**ITERATIVE STATEMENTS:** while, do-while and for loops. UNIT - IV **ARRAYS**: Definitions, Initialization, Characteristics of an array, Array Categories. **STRINGS**: Declaration and Initialization of strings, String handling functions. STORAGE **CLASSES**: Automatic, External, Static and Register Variables. UNIT - V **POINTERS**: Fundamentals, Declaration and initialization of Pointers, Arithmetic Operations, Pointers and Arrays. **FUNCTIONS**: Definition, Function Prototypes, Types of functions, Call by Value and Call by Reference, Recursion. UNIT - VI **STRUCTURES**: Definition, Declaration and Initialization of Structures. **UNIONS**: Definition, Declaration and Initialization of Union. **FILES**: Introduction, File Types, Basic operations on Files, File I/O, Command Line Arguments. |
| **Text Books and References** | Text Books:1. Programming with ANSI & TURBO C by Ashok N.Kamthane, Pearson Education 2007.
 |
| Reference Books:1. A Book on C by Al Kelley/Ira Pohl, Fourth Edition, Addison-Wesley.1999
2. Let Us C by Yashavant Kanetkar, BPB Publications.
3. Programming in ANSI C by Balaguruswamy 6 th Edition, Tata Mc Graw Hill Education, 2012.
 |

**CO-PO Mapping:** 3-High Mapping, 2-Moderate Mapping, 1-Low Mapping, - -Not Mapping

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | - | 3 | - | - | - | 1 | - | - | - | - | - | - |
| **CO2** | - | 2 | - | 3 | - | - | - | - | - | - | - | - |
| **CO3** | 2 | - | 3 | - | - | - | 2 | - | - | - | - | - |
| **CO4** | - | 2 | - | - | - | 3 | - | - | - | - | - | - |
| **CO5** | - | - | 3 | - | - | - | - | 1 | - | - | - | - |
| **CO6** | - | 3 | - | - | 2 | - | - | - | 3 | - | - | 1 |