**20CS1101 -PROGRAMMING FOR PROBLEM SOLVING**

(Civil Engineering)

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| **Course category:** | Engineering Science | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-0-0 |
| **Prerequisite:** | Knowledge on computer fundamentals and basic mathematics | **Sessional Evaluation:** | 40 |
| **Univ. Exam Evaluation:** | 60 |
| **Total Marks:** | 100 |

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| **Course Objectives** | 1. To learn the procedure how to develop algorithms, representations and programming developmentsteps 2. To learn the basic building blocks of Clanguage. 3. Usage of C constructs (arrays, structures, pointers and file management) to develop variousprograms. 4. To create better awareness how effectively utilizes the concepts of C for applicationdevelopment. | |
| **Course Outcomes** | 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, go to. | |

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|  | **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, Pointersand 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 Reference Books** | **TEXT BOOKS:**   * + - 1. Ashok N. Kamthane, *“Programming with ANSI & TURBO C”*, Pearson Education, 3rd edition, 2007.   **REFERENCE BOOKS:**   1. Al Kelley, Ira Pohl, *“Programming in C”*, Addison-Wesley, 4th edition, 1999. 2. [YashavantKanetkar,](http://www.amazon.in/s/ref%3Ddp_byline_sr_book_1?ie=UTF8&amp;amp%3Bfield-author=Yashavant%2BKanetkar&amp;amp%3Bsearch-alias=stripbooks)*“Let Us C”*, BPB Publications, 16th edition, 2019. 3. Balaguruswamy,*“Programming in ANSI C”*, 6thedition, Tata McGraw Hill Education, 2018. |