19CS1101 - PROGRAMMING FOR PROBLEM SOLVING

(Common to all branches)

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| **Course category:** | Program 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:** | 40  60  100 |

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| **Course**  **Objectives** | Students undergoing this course are expected to: | |
| 1. To learn the procedure how to develop algorithms, representations and programming development steps 2. To learn the basic building blocks of C language. 3. Usage of C constructs (arrays, structures, pointers and file management) to develop various programs 4. To create better awareness how effectively utilize the concepts of C for application development | |
| **Course Outcomes** | Upon successful completion of the course , the 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**  **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.  **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 Reference Books** | **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](http://www.amazon.in/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=Yashavant+Kanetkar&search-alias=stripbooks), BPB Publications. 3. Programming in ANSI C by Balaguruswamy 6th Edition, Tata McGraw Hill Education, 2012. | |
| **E-Resources** | 1. <https://nptel.ac.in/courses> 2. <https://freevideolectures.com/university/iitm> | |

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| Contribution of Course Outcomes towards achievement of Program Outcomes (3-High, 2-Medium, 1-Low) | | | | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 |
| CO1 | 3 | 3 | 3 | - | 2 | - | - | - | - | - | 3 | 3 | - | - |
| CO2 | 3 | 3 | 2 | - | 2 | - | - | - | - | - | 3 | 3 | - | - |
| CO3 | 3 | 3 | 3 | - | 3 | - | - | - | - | - | 2 | 2 | - | - |
| CO4 | 3 | 3 | 2 | - | 2 | - | - | - | - | - | 2 | 3 | - | - |
| CO5 | 3 | 3 | 2 | - | 2 | - | - | - | - | - | 3 | 2 | - | - |
| CO6 | 3 | 3 | 2 | - | 2 | - | - | - | - | - | 3 | 3 | - | - |