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| Course code | Course Title | Core/ Elective |
| 5ES203CS | Programming for Problem Solving | Core |
| L | T | P/D | Credits | CIE | SEEE |
| 3 | 0 | 0 | 3 | 40 | 60 |
| **Prerequisite:** Mathematical Knowledge, Logical and Analytical Thinking**Course Objectives:** The objective of this course is to make the student* To introduce the basic concepts of Computing environment, algorithms and flowcharts
* To acquire knowledge about the basic concept of writing a program
* To understand modular and structured programming constructs in C
* To learn the usage of structured data types, data handling and memory management using pointers

**Course Outcomes:**After completion of the course, the student will be able to1. Formulate algorithms and learn fundamental program methodologies of C programming.
2. Understand control statements and interpret derived data types with mathematical and engineering problems.
3. Develop modular programming techniques to solve searching, sorting and file system problems
4. Recognize pre-processor directives and user defined usage..
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| **Unit I (11)** Introduction to Computers: Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.). Algorithm, Flowchart / Pseudo code with examples Introduction to C Language: History of C, Features, Structure of C program, Character set, Tokens,Variables, Data types, I/O statements, Type conversion Syntax and Logical Errors in compilation, object and executable code.Unit – II (11)Operators and Control Structures: Operators, Operator precedence, Arithmetic expressions, Conditional Branching and Loops, Writing and valuation of conditionals and consequent branchingArrays: Arrays (1-D, 2-D), Strings and its library functions. |

Unit – III (10)

Basic Algorithms: Searching, Basic Sorting Algorithms (Bubble and Selection). Functions: Functions, storage classes, Parameter passing techniques Passing arrays to functions, Recursion Concept, Command line arguments.

Unit – IV (10)

Pointers: Idea of pointers, Defining pointers, array of pointers, pointer arithmetic, dynamic memory allocation,

Structure: Structures, Defining structures and Array of Structures, self – referential structures, Unions concept, Functions and structures, Enum, Bitfields.

Unit – V (8)

Pre-processor Directives: File Inclusion, Macros Substitutions, Conditional Compilation.

File Handling: Introduction to File Handling, Types of files, File operations, File input/output statements.

**Text Books:**

T1. Computer Science A structured programming approach using C, Behrouz A. Forouzan and Richard F. Gilberg , Cengage Learning , 2007 ,Third Edition (Unit 1-5)

T2. Schaum's Outline of Programming with C, Byron Gottfried, McGraw-Hill 2019, Fourth Edition (Unit 1-5)

T3. Data Structures and Program Design in C, Robert Kruse, Bruce Leung, Tondo, Pearson, II Edition

**References/ Suggested Reading**

R1. C Programming Language, Brian W Kenningham, Dennis M Ritchie, Pearson, II Edition

R2. How to solve it by Computer, R G Dromey, Pearson Edition