**23A05101T-INTRODUCTION TO PROGRAMMING**

**(Common to All branches of Engineering)**

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| **Course Category:** | Engineering science | **Credits** | 3 |
| **Course Type:** | Theory | **Lecture-Tutorial-Practical:** | 3-0-0 |
| **Pre-requisite:** | Basics of Computers | **Sessional Evaluation:**  **External Exam Evaluation:**  **Total Marks:** | 30  70  100 |

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| **Course Objectives** | To make the student learn about | |
| * + To introduce students to the fundamentals of computer programming.   + To provide hands-on experience with coding and debugging.   + To foster logical thinking and problem-solving skills using programming.   + To familiarize students with programming concepts such as data types, control structures, functions,   and arrays.   * + To encourage collaborative learning and teamwork in coding projects. | |
| **Course Outcomes** | A student after completion of the course will beable to | |
| **CO1** | Understand basics of computers, the concept of algorithm and algorithmic thinking. |
| **CO2** | Analyze a problem and develop an algorithm to solve it. |
| **CO3** | Implement various algorithms using the C programming language. |
| **CO4** | Understand more advanced features of C language. |
| **CO5** | Develop problem-solving skills and the ability to debug andoptimize the code. |
| **Course content** | **UNIT-I:Introduction to Programming and Problem Solving**  History of Computers, Basic organization of a computer: ALU, input-output units, memory, program counter,  Introduction to Programming Languages, Basics of a Computer Program-Algorithms ,flowcharts  (Using Dia Tool),pseudo code. Introduction to Compilation and Execution, Primitive Data Types, Variables,  and Constants,BasicInputandOutput,Operations,TypeConversion,andCasting.  Problem solving techniques: Algorithmic approach, characteristics of algorithm ,  Problem solving strategies: Top-down approach, Bottom-up approach, Time and space complexities of  algorithms.  **UNIT-II :Control Structures**  Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, do-while) Break and  Continue.  **UNIT-III :Arrays and Strings**  Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to  Strings.  **UNIT-IV: Pointers & User Defined Data types**  Pointers, dereferencing and address operators, pointer and address arithmetic, array manipulation using pointers,  User-defined data types-Structures and Unions.  **UNIT-V : Functions & File Handling**  Introduction to Functions, Function Declaration and Definition ,Function call Return Types and Arguments,  Modifying parameters inside functions using pointers ,arrays as parameters .Scope and Lifetime of Variables,  command line arguments, Preprocessor directives, Basics of File Handling | |
| **Text Books & References** | **Text Books:**   1. "The C Programming Language",BrianW.KernighanandDennisM.Ritchie,Prentice-Hall,1988. 2. Schaum’sOutlineofProgrammingwithC,ByronSGottfried,McGraw-HillEducation,1996.   **ReferenceBooks:**   1. ComputingfundamentalsandCProgramming,Balagurusamy,E.,McGraw-HillEducation,2008. 2. ProgramminginC, RemaTheraja, Oxford, 2016,2ndedition 3. C Programming, A Problem Solving Approach, Forouzan, Gilberg,Prasad,CENGAGE,3rd edition | |

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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 | - | - | - | - | - | 3 | 3 | 3 | 3 |
| CO2 | 3 | 3 | 2 | - | 3 | - | - | - | - | - | 2 | 3 | 3 | 3 |
| CO3 | 3 | 3 | 2 | 2 | 3 | - | - | - | - | - | 2 | 2 | 3 | 3 |
| CO4 | 3 | 3 | 2 | 3 | 3 | - | - | - | - | - | 3 | 3 | 3 | 3 |
| CO5 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |