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| <b>2018-19<br/>Onwards<br/>(MR-18)</b> | <b>MALLA REDDY ENGINEERING COLLEGE<br/>(Autonomous)</b>                                     | <b>B.Tech.<br/>I Semester</b> |          |          |
| <b>Code: 80501</b>                     | <b>PROGRAMMING FOR PROBLEM SOLVING<br/>(Common for CE, EEE, ME, ECE, CSE, IT and Min.E)</b> | <b>L</b>                      | <b>T</b> | <b>P</b> |
| <b>Credits: 3</b>                      |   | <b>3</b>                      | <b>-</b> | <b>-</b> |

**Prerequisites:** NIL

**Course Objectives:**

This course provides the fundamental concepts of computers and introduce to the students to the field of programming using C language, apply the control structures, iterations statements, arrays, functions, strings, pointers, structures, unions and files. This course also explains the concepts of searching and sorting techniques in C language.

**MODULE I: Fundamentals and Introduction to ‘C’ Language [11 Periods]**

Fundamentals: Hardware, Software, Programming languages, Number Systems, Translators, Introduction to Operating System, Program Development steps - Algorithm, Flow charts.

Introduction to ‘C’ Language: History, Simple C Program, Identifiers, Preprocessor Directives- Include and define, Basic data types, User-defined data types, Variables, Constants, Type qualifiers, Managing Input / Output, Operators, Precedence and Associativity, Expression Evaluation, Type conversions, Simple ‘C’ Programming examples.

**MODULE II: Control Statements & Arrays [09 Periods]**

Control Statements: Conditional statements- if and switch statements, ternary operator?: , Loop Control Statements – while, for, do-while, break, continue and goto statements.

Arrays: Basic concepts, One-dimensional arrays, Two–dimensional arrays, Multi-dimensional arrays.

**MODULE III: Strings & Pointers [09 Periods]**

**A:** Basic concepts, String Input / Output functions, Arrays of strings, String handling functions.

**B:** Basic concepts, Pointer arithmetic, Pointers and strings, Pointers and arrays, Dynamic Memory Allocation.

**MODULE IV: Functions & Derived Types [09 Periods]**

**Functions** - Basics, User defined functions, Inter function communication, Library functions, Storage Classes-auto, register, static, extern, Scope rules, Array and string manipulations using functions, Recursive functions, Pointers and functions.

**Derived types** - Structures – Basic concepts, Nested structures, Arrays of structures, Structure manipulations using functions, Pointers to structures, Self-referential structures, Unions, bit fields

**MODULE V: File I/O, Sorting and Searching [10 Periods]**

File I/O: Basic concepts, Text files and Binary files, File input / output operations, File status functions (error handling), Command-Line Arguments, C programming examples.

Sorting and Searching: Sorting - selection sort, bubble sort, insertion sort, searching - linear and binary searching methods.

### **TEXTBOOKS**

1. PradipDey, Manas Ghosh, “**Programming in C**”, Oxford University Press, 2<sup>nd</sup> Edition, 2011.
2. E. Balagurusamy, “**Computer Programming in C**”, Tata McGraw Hill, 1<sup>st</sup> Edition, 2013.

### **REFERENCES**

1. Brian W. Kernighan, Dennis M. Ritchie, “**The C Programming Language**”, PHI, 2<sup>nd</sup> Edition, 1990.
2. Greg Perry and Dean Miller, “**C Programming Absolute beginner's guide**”, QUE Publishers, 3<sup>rd</sup> Edition, 2013.
3. Paul Deitel and Harvey Deitel, “**C How to Program**”, PHI, 7<sup>th</sup> Edition, 2012.
4. Behrouz A. Forouzan, E.V.Prasad, Richard F. Gilberg, “**C programming: A Problem-Solving Approach**”, Cengage Learning Press, 1<sup>st</sup> Edition, 2011.

### **E-RESOURCES**

1. [http://oxford.universitypress.ac.in/eBooks/ Programming in C](http://oxford.universitypress.ac.in/eBooks/Programming%20in%20C).
2. <https://www.journals.elsevier.com/science-of-computer-programming>
3. <http://www.ejournalofsciences.org>
4. [http://onlinecourses.nptel.ac.in/iiitk\\_cs-101](http://onlinecourses.nptel.ac.in/iiitk_cs-101)
5. <http://onlinevideolecture.com/ebooks/?subject=C-Programming>

### **Course Outcomes:**

At the end of the course, students will be able to

1. Understand the basic terminology, write, compile and debug programs in computer programming.
2. Apply different types of control structures and arrays in a computer programming.
3. Develop programs that make use of concepts such as strings and pointers in C language.
4. Compare parameter passing techniques, structures and unions in computer programming.
5. Analyze file operations, searching and sorting methods.