



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

COURSE CONTENT

PROBLEM SOLVING USING C AND C++								
I Semester: CE / CSD / CSE / CSM / ECE / EEE / ME								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
2410501	Foundation	L	T	P	C	CIA	SEE	Total
		3	0	0	3	40	60	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45			
Prerequisites: There are no prerequisites to take this course.								

Course Overview:

The Course Provides good foundation in procedural oriented and object- oriented programming concepts. It provides overview on basic building blocks of procedural oriented concepts like arrays, pointers, structures, strings. It comprises object-oriented concepts such as information hiding, encapsulation, inheritance and polymorphism. C programming is used in operating systems, embedded devices, OS kernels, drivers, IoT applications. C++ is widely used for creating graphics-heavy software, game engines, VR applications, and web browsers.

Course Objectives:

The students will try to learn

- Using of structured programming approach in solving problems
- How to use arrays, pointers, strings and structures in solving problems
- Defining of structures in C and classes in C++
- Importance of inheritance in object-oriented programming
- Handling of exceptions in programs

Course Outcomes: After Completion of the Course, Students should be able to

CO1: Develop programs using Control statements and Repetitive statements

CO2: Modularize the code with functions so that they can be reused

CO3: Learn about Object oriented concepts

CO4: Design programs by using Inheritance concepts

CO5: Implement polymorphism and Exception Handling

Module-I: Introduction to programming

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Introduction Procedure Oriented and Object-Oriented Programming. Algorithm, Flowchart, Pseudo code. Creating and Running of C Program. Structure of C program – C character set, C Tokens: Constants, Variables, Keywords, Identifiers, C data types, C operators. Standard I/O in C (scanf, printf), Conditional Control statements (if and Switch) Statements. Repetitive statements: While, Do While and For Loops - Use of Break and Continue Statements.

Module-II: Functions, Arrays, Strings and Pointers

[12]

Arrays: Introduction, Declaration, Creating and Accessing of One-Dimensional Arrays, Two- Dimensional Arrays. Strings and Pointers: Introduction to strings, string handling functions, Arrays of strings, Introduction to pointers, Dynamic Memory allocation.

Functions: Defining Functions – User Defined Functions, Storage Classes, passing parameters: Call By Value, Call By Reference, Recursion, Command-line Arguments.

Module-III: Structures and Classes

[8]

Structures: Defining structures, initializing structures, unions, Array of structures OOPS Concepts: Class, Object, Abstraction, Encapsulation, Inheritance and Polymorphism.

C++ Classes and Data Abstraction: Class definition, Class structure, Class objects, Class scope, this pointer, Friends to a class, Static class members, Constant member functions, Constructors and Destructors, Dynamic creation and destruction of objects, Data abstraction.

Module-IV: Inheritance

[7]

Inheritance: Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class members, Base and Derived class construction, Destructors, Virtual base class.

Module-V: Polymorphism and Exception Handling

[8]

Virtual Functions and Polymorphism: Static and Dynamic binding, virtual functions, Dynamic binding through virtual functions, Virtual function call mechanism, Pure virtual functions, Abstract classes, Implications of polymorphic use of classes, Virtual destructors.

Exception handling: Try, throw and catch.

TEXT BOOKS:

1. Jeri R. Hanly and Elliot B. Koffman, Problem solving and Program Design in C 7th Edition, Pearson.
2. B.A. Forouzan and R.F. Gilberg C Programming and Data Structures, Cengage Learning, (3rd Edition).

REFERENCE BOOKS:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.
2. E. Balagurusamy, Computer fundamentals and C, 2nd Edition, McGraw-Hill.
3. Yashavant Kanetkar, Let Us C, 18th Edition, BPB.
4. R.G. Dromey, How to solve it by Computer, Pearson (16th Impression).
5. Programming in C, Stephen G. Kochan, Fourth Edition, Pearson Education.
6. Herbert Schildt, C: The Complete Reference, Mc Graw Hill, 4th Edition.
7. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill.

ELECTRONIC RESOURCES:

1. <https://www.geeksforgeeks.org/c/c-programming-language/>
2. <https://www.programiz.com/c-programming>
3. <https://www.w3schools.com/c/>
4. <https://www.codechef.com/learn/course/c>
5. <https://www.geeksforgeeks.org/c-plus-plus-online-course/>
6. <https://www.learncpp.com/>
7. <https://www.programiz.com/cpp-programming>
8. <https://www.w3schools.com/cpp/>

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)