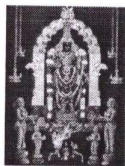
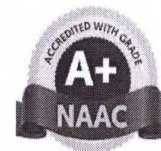


SHRI GNANAMBICA DEGREE COLLEGE: MADANAPALLE



(AUTONOMOUS)
Course 2: Programming with C++
SEMESTER III
(W.E.F.2024-25)
Program: Computer Science (MINOR)



Hours per week: 4

Credits: 3

Course Objectives:

- To introduce the fundamental concepts of object-oriented programming using C++.
- To design and implement real-world applications using OOP principles.
- To understand the principles of generalization and specialization and implementing through inheritance in C++.

Course Outcomes:

Upon successful completion of the course, students will be able to:

- *Students will be able to develop basic C++ programs using object-oriented concepts*
- *Students will be able to constructors, understand and implement encapsulation to design C++ applications that provide data security*
- *Students will be able to understand abstraction, work with current objects and implement polymorphism.*
- *Students will be able to work with inheritance and overridden functions*
- *Students will be able to work with arrays and libraries like math.h etc*

UNIT I

Need for Object-Oriented Programming, Limitations of Procedural Programming, Introduction to C++ – history and features, Structure of a C++ program, Compilation and execution, Variables and data types, Constants, Operators and Expressions, Input and Output using cin and cout.

UNIT II

Conditional statements – if, if-else, switch, Loops – for, while, do-while, Classes and Objects, Accessing Members, Object-Oriented Programming concepts such as Abstraction, Encapsulation, Polymorphism, and Inheritance, Encapsulation using private, public, and protected members, Constructors and Destructors, Pointers of objects, Dynamic memory allocation using new and delete keywords.

UNIT III

Member functions and Non-member functions, Scope Operator, Static Members, Types of Variables – class variable, instance variable, constant variable, local variable, and global variable, Arrays of Objects, Function Calls – call by value, call by reference, and passing alias, Abstraction concepts including Data Abstraction, Functional Abstraction, and use of the this pointer.



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UNIT IV

Overloading – Function Overloading and Operator Overloading, Inheritance – Definition and Types of Inheritance such as Single, Multilevel, Hierarchical, and Multiple Inheritance, Access Specifiers in Inheritance including the use of the protected keyword, Private vs. Public Inheritance, and Function Overriding.

UNIT V

Dynamic Binding, Virtual Functions and Abstract Classes, Multiple Inheritance, Virtual Inheritance, Usage of standard libraries such as math.h and string.h.

References:

Online references :

<https://www.w3schools.com/cpp/>

<https://www.geeksforgeeks.org/c-plus-plus/>

<https://www.tutorialspoint.com/cplusplus/index.htm>

<https://www.tpointtech.com/cpp-tutorial>

Reference Books :

1. C++ Primer by Lippman, Lajoie, and Moo: A comprehensive introduction to C++ programming, suitable for both beginners and those with some experience
2. Programming: Principles and Practice Using C++ by Bjarne Stroustrup: Focuses on object-oriented programming and emphasizes practical aspects of software development.



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SHRI GNANAMBICA DEGREE COLLEGE: MADANAPALLE



(AUTONOMOUS)
Course 2: Programming with C++ - Practicals
SEMESTER III
(W.E.F.2024-25)
Program: Computer Science (MINOR)



Hours per week: 2

Credits: 1

List of Experiments

Experiment 1: Working with Classes, Constructors, and this Keyword

Problem Statement:

Write a C++ program to read a number from user and display whether it is Armstrong number or not.

Experiment 2: Working with Classes, Constructors, and this Keyword

Problem Statement:

Design a class Employee with private data members for id, name, and Salary. Implement default and parameterized constructors. Use the this keyword to differentiate between local and instance variables.

Experiment 3: Implementing Inheritance and Method Overriding

Problem Statement:

Create a class hierarchy with Person as a base class and Employee as a derived class. Demonstrate inheritance and display employee details.

Experiment 4: implementing polymorphism

Problem Statement:

Write a C++ program that defines a class "calculate" with a member function add() overloaded to take 2, 3 and 4 arguments, add them and display the sum.

Experiment 5: Strings

Problem Statement:

Write a program that overloads the operator + for string concatenation

Experiment 6: implementing virtual Inheritance

Problem Statement:

Write a program that demonstrates virtual inheritance

Experiment 7: usage of static variables

Problem Statement:

Write a class that demonstrates accessing and usage of static variables.



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Experiment 8: implementation of dynamic binding

Problem Statement:

Write a base class patient, has two derived classes inpatient and outpatient. By implementing dynamic binding read and write data of one inpatient and one outpatient.



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SHRI GNANAMBICA DEGREE COLLEGE: MADANAPALLE

(AUTONOMOUS)

Course 2: Programming with C++

SEMESTER III

(W.E.F.2024-25)

Program: Computer Science (MINOR)

Question Paper – Blue Print

Time : 3 Hrs

Marks : 70

PART-A

Answer any 4 of the 8. Each Question Carries 5 marks.

(4 x 5 =20)

1. Question
2. Question
3. Question
4. Question
5. Question
6. Question
7. Question
8. Question

PART-B

Answer one from each unit. Each Question Carries 10 marks.

(5X10=50)

UNIT 1

9. Question

OR

10. Question

UNIT 2

11. Question

OR

12. Question

UNIT 3

13. Question

OR

14. Question

UNIT 4

15. Question

OR

16. Question

UNIT 5

17. Question

OR

18. Question



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