RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL
New Scheme Based On AICTE Flexible Curricula
Information Technology, III-Semester
IT303 Object Oriented Programming & Methodology

Course Objectives

1. The objective of this course is to understand the advantage of object oriented programming over procedure oriented programming.

2. To help students to understand the key features of Object Oriented Programming and Methodology like objects, methods, instance, message passing, encapsulation, polymorphism, data hiding, abstract data and inheritance.

3. To develop understanding of pointers and memory management.

4. To be able to develop understanding of file input/output and templates

Unit I- Introduction: Object oriented programming, Introduction, Application, characteristics, difference between object oriented and procedure programming, Comparison of C and C++, Cout, Cin, Data Type, Type Conversion, Control Statement, Loops, Arrays and string arrays fundamentals, Function, Returning values from functions, Reference arguments, Overloaded function, Inline function, Default arguments, Returning by reference.

Unit II- Object and Classes: Implementation of class and object in C++, access modifiers, object as data type, constructor, destructor, Object as function arguments, default copy constructor, parameterized constructor, returning object from function, Structures and classes, Classes objects and memory, static class data, Arrays of object, Arrays as class Member Data, The standard C++ String class, Run time and Compile time polymorphism.

Unit III- Operator overloading and Inheritance: Overloading unary operators, Overloading binary operators, data conversion, pitfalls of operators overloading, Concept of inheritance, Derived class and base class, access modifiers, types of inheritance, Derived class constructors, member function, public and private inheritance.

Unit IV- Pointer and Virtual Function: Addresses and pointers, the address-of operator & pointer and arrays, Pointer and Function pointer, Memory management: New and Delete, pointers to objects, debugging pointers, Virtual Function, friend function, Static function, friend class, Assignment and copy initialization, this pointer, dynamic type information.

Unit V-Streams and Files: Streams classes, Stream Errors, Disk File I/O with streams, file pointers, error handling in file I/O with member function, overloading the extraction and insertion operators, memory as a stream object, command line arguments, printer output, Function templates, Class templates Exceptions, Containers, exception handling.

Course Outcomes

On the completion of this course students will be able to:

1. Recognize attributes and methods for given objects.

2. Define data types and also deal with operations applied for data structures.

3. Implement algorithms and complex problems.

Reference Books:

1. E. Balaguruswami, ”Object Oriented Programming in C++”, TMH.

2. Robert Lafore, "Object Oriented Programming in C++", Pearson.

3. M.T. Somashekare, D.S. Guru, " Object-Oriented Programming with C++", PHI.

4. Herbert Shildt, "The Complete Reference C++", Tata McGraw Hill publication.

List of Experiments:

1. Write a program to find out the largest number using function.

2. Write a program to find the area of circle, rectangle and triangle using function overloading.

3. Write a program to implement complex numbers using operator overloading and type conversion.

4. Write a program using class and object to print bio-data of the students.

5. Write a program which defines a class with constructor and destructor which will count number of object created and destroyed.

6. Write a program to implement single and multiple inheritances taking student as the sample base class.

7. Write a program to add two private data members using friend function.

8. Write a program using dynamic memory allocation to perform 2x2 matrix addition and subtraction.

9. Write a program to create a stack using virtual function.

10. Write a program that store five student records in a file.

11. Write a program to get IP address of the system.

12. Write a program to shutdown the system on windows operating system.