

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD

Semester : Third

Subject Title : Object Oriented Programming

Subject Code : 12063

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
04	--	04	03	100	50#	--	25@	175

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

Object oriented programming has become the preferred approach for most software projects. Object oriented programming offers a new and powerful way to cope with complexity. Object oriented programming concepts are useful for constructing complex physical systems such as car, airplanes etc.

Instead of viewing the program as a series of steps to be carried out ,it views as a group of objects that have certain properties and can take appropriate actions . Among the Object oriented programming languages available C++ is most widely used language.

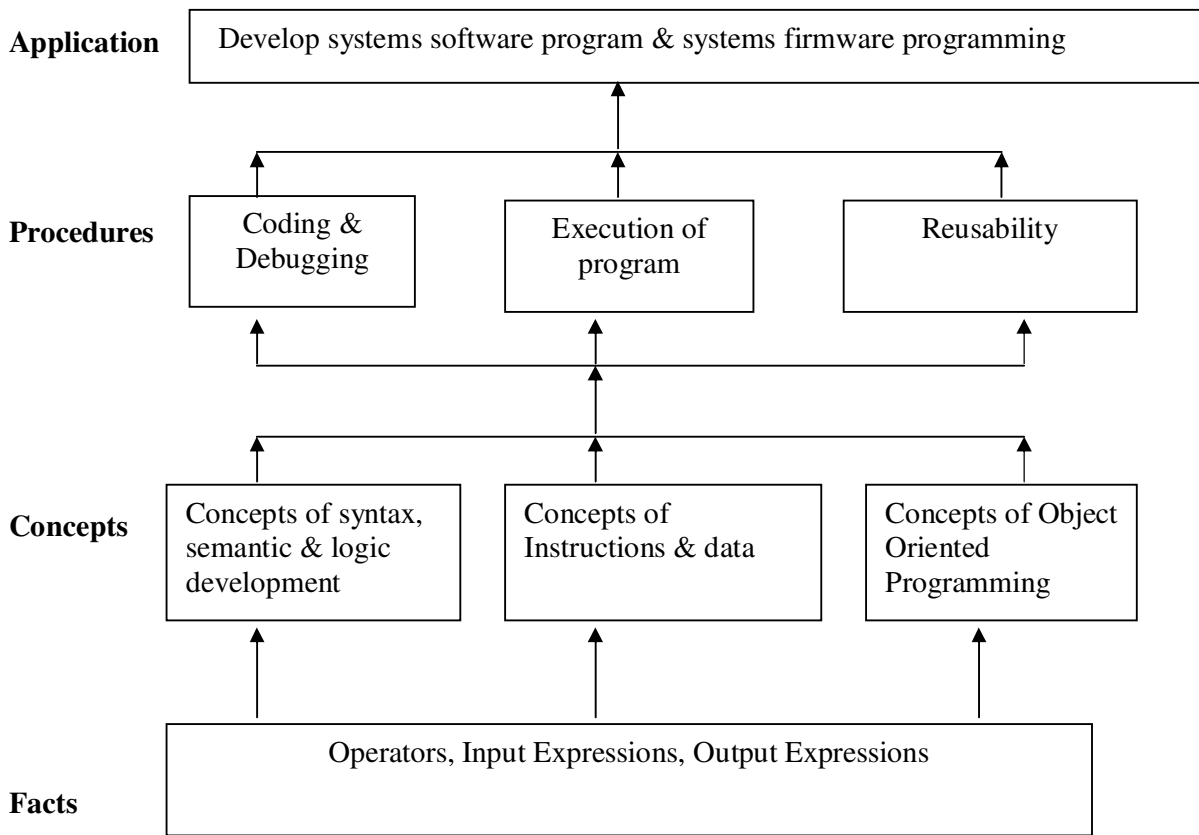
Different programs based on Inheritance, polymorphism, encapsulation, overriding requires knowledge of C++. This subject acts as a base for languages JAVA, VC++ & UML.

Objectives:

The Student will be able to:

- Write programs using objects & classes.
- Develop programs to create and destroy the objects
- Use existing operators for different meanings.
- Using reusability concept.
- Implement pointers for arrays, strings & object.
- Describe polymorphism, concepts, it's types, virtual function & write program for same.
- Apply formatted & unformatted console I/O operation & perform file related activities using C++ streams.

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	Concept of Object Oriented Programming.	06	08
	History & features: It's need & requirement, procedure oriented programming versus object oriented programming, basic concepts object oriented programming, object oriented languages. Beginning with C++: Concepts & structure of C++ programming, concepts of structure.		
02	Objects & classes	12	18
	Specifying a class, Defining member functions, Access specifiers (public, private) Arrays within a class, Creating objects, memory allocation for objects, static data & member function, Arrays of objects, objects as function argument.		
03	Constructors and Destructors.	10	14
	Concept of Constructor, Types of constructors (Default, Parameterized, copy,), Overloaded Constructors (Multiple Constructor), Constructor with default argument, Destructors. Function overloading, Operator overloading (overloading unary & binary operators), rules for overloading operators.		
04	Inheritance	08	16
	Concepts of inheritance, Derived classes, Member declaration (Protected), Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance), Virtual base classes, Abstract classes, Constructors in derived classes, Member classes.		
05	Pointers in C++	12	14
	Concepts of pointer (Pointer declaration, pointer operator, address operator, pointer expressions, and pointer arithmetic), Pointers & functions (Call by value, call by reference, pointer to functions, passing function to another function), Pointers in arrays (Searching, insertion & deletion), Pointers to string (Searching, finding length, comparison, concatenation, reverse), Pointers & objects (Pointers to objects, this pointer, and pointer to derived classes).		
06	Polymorphism	06	14
	Concepts of polymorphism, types of polymorphism, function Overloading & function overriding, Virtual function, Static & dynamic binding.		
07	Basic function of I/O system basics & File Processing	10	16
	Stream classes, using formatted & unformatted functions, using manipulator to format I/O, Basics of file system, opening & closing a file, reading & writing character from a file (get(), put(), getline(), write()), Command line arguments.		
Total		64	100

Practical:

Skills to be developed:

Intellectual skills:

- Use of programming language constructs in program implementation.
- To be able to apply different logics to solve given problem.
- To be able to write program using different implementations for the same problem

- Study different types of errors as syntax semantic, fatal, linker & logical
- Debugging of programs
- Understanding different steps to develop program such as
 - Problem definition
 - Analysis
 - Design of logic
 - Coding
 - Testing
 - Maintenance (Modifications, error corrections, making changes etc.)

Motor skills:

- Proper handling of Computer System.

List of Practical:

Sr. No.	Title of Experiment	No of practical
1.	Programs to input & output data (Simple programs).	01
2.	Programs to create object of class	01
3.	Programs to create arrays of objects	02
4.	Program to access static member variables	01
5.	Programs using object as function arguments using friend function.	01
6.	Programs to define Class using constructor & destructor.(Default constructor ,Multiple constructor, Copy constructor, Overloaded constructor)	01
7.	Program using constructor with default argument	01
8.	Program to overload unary & binary operator	02
9.	Single inheritance & multilevel using protected member	02
10.	Multiple inheritance & virtual base class	02
11.	Program for pointers to arrays of integer	02
12.	Program for pointers to strings	02
13.	Program for pointers to objects	02
14.	Program for this pointer.	01
15.	Program for (virtual functions) runtime polymorphism	01
16.	Programs for overload function	01
17.	Format output using manipulators & own manipulator.	02
18.	Program for file processing	02

Learning Recourses:

1. Books:

Sr.No.	Author	Title	Publisher
01	Schilt	C++ The complete reference	Tata McGraw Hill
02	Balgurusamy	Object oriented programming with C++	Tata McGraw Hill
03	Lafore Robert	Object oriented programming in Turbo C++.	Galgotia
04	Kanetkar	Let's C++	BPB

2. Website for mini projects:

- www.sourcecodesworld.com
- www.softteam.com
- www.cplusplus.com/od/beginnerctutorial

3. Magazines:

- Express computers.
- C / C++ journal

Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts of students.