Course Name   **: Computer Engineering Group**

Course Code   **: CO/CD/CM/CW/IF**

Semester   **: Fourth**

Subject Title   **: Object Oriented Programming**

Subject Code   **: 17432**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	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:

The ability to organize & process information is key to success in modern age. Object Oriented Programming has become the most preferred approach for software projects. It offers a new and powerful way to cope up with complexity of real world problems. Among the OOP languages available, C++ is one of the most widely used language.

Instead of viewing program as a series of steps to be carried out, OOP approach views it as a group of objects that have certain properties & can take appropriate actions.

Object Oriented Concepts like inheritance, polymorphism, data abstraction and encapsulation etc. requires knowledge of C++, which also acting as base for programming languages like Java, Object Oriented Modeling & Designing (OOMD), VC++.
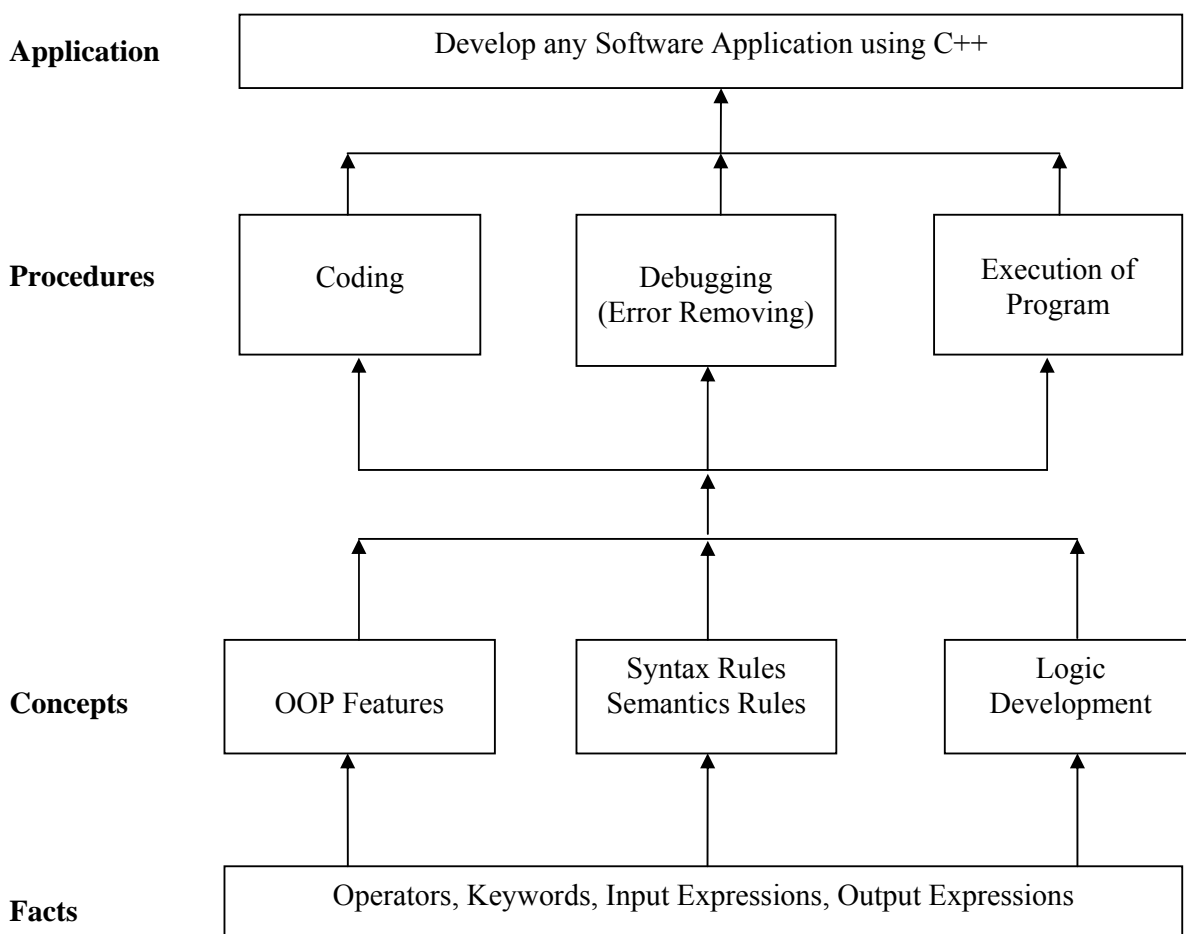
Objectives:

To develop following skills:

Intellectual Skills:

1. Understand the concepts of OOP.
2. Implement programs based on OOP concepts.
3. Understand basic fundamentals of C++.
4. Develop small software applications using C++.

Motor Skills:

1. Proper Handling of Computer System.

Learning Structure:

Application	Develop any Software Application using C++

Procedures	Coding	Debugging (Error Removing)	Execution of Program

Concepts	OOP Features	Syntax Rules Semantics Rules	Logic Development

Facts	Operators, Keywords, Input Expressions, Output Expressions

Theory:

Topic No	Contents	Hours	Marks

1	**Principles of Object Oriented Programming**
	Objectives:
	  ➢ State OOP's basic Concepts.
	  ➢ Difference between OOP & POP.
	  ➢ C++ Programming structure.
	1.1 Its need & requirement, Procedure Oriented Programming (POP) verses Object Oriented Programming (OOP), Basic concepts of Object Oriented Programming, Object Oriented Languages, Applications of OOP.
	1.2 Beginning with C++: What is C++? , keywords, variables, constants basic data types, operators, scope resolution operator, memory management operators, console input/output, structure of C++ program.
		06	12

2	**Classes & Objects:**
	Objectives:
	  ➢ Defining classes & objects.
	  ➢ Declaring & using static data member & static member function, friend function.
	  ➢ Programs based on classes & objects.
	2.1 Structures in C++.
	2.2 Class & Object: Introduction, specifying a class, access specifies, defining member functions, creating Objects, memory allocations for objects.
	2.3 Array of Objects, Object as function arguments.
	2.4 Static data members, static member function, friend Function
		08	20

3	**Constructors & Destructors**
	Objectives:
	  ➢ State Concepts of constructor & destructor, types of constructor.
	  ➢ Programs based on constructor & destructors
	3.1 Concepts of Constructors, Types of constructors: Default, Parameterized, Copy.
	3.2 Overloaded Constructors :Multiple Constructors in a Class, Constructors with default arguments.
	3.3 Destructors.
		08	14

4	**Inheritance: Concept of Reusability**
	Objectives:
	  ➢ Concept of Inheritance & its types.
	  ➢ Types of Visibility modes.
	  ➢ Programs based on Inheritance.
	4.1 Introduction, defining a derived class, visibility modes & effects.
	4.2 Types of Inheritance : Single, multilevel, multiple, hierarchical, hybrid
	4.3 Virtual base class, abstract class, constructors in derived class.
		08	20

5	**Pointers in C++** **Objectives:** ➢ Declare Pointer & Pointer arithmetic.	10	18

	➢ Pointer to Arrays, string & Object. ➢ "this" pointer concept. 5.1 Concepts of Pointer: Pointer declaration, Pointer operator, address operator, Pointer arithmetic. 5.2 Pointer to Array: Searching, Insertion, deletion 5.3 Pointer to String: Searching, finding length, comparisons, concatenation, reverse 5.4 Pointer to Object: Pointer to Object, this pointer, Pointer to derived class.		
6	**Polymorphism** **Objectives:** ➢ Polymorphism concept & its types. ➢ Program for overloading operators & functions. 6.1 Introduction, Types of polymorphism: Compile time, Run time 6.2 Compile time Polymorphism: Function overloading, operator overloading: Overloading unary and binary operators, Rules for operator overloading. 6.3 Run time polymorphism: Virtual functions, rules for virtual functions, pure virtual function.	08	16
	Total	**48**	**100**

List of Practical:

Sr. No.	Title of Experiment
1	Write a program to Input & Output data for exchanging values of two variables.
2	Develop a program to declare a class 'person' having data members name, age & salary. Accept and display this data for one object.
3	Write a program to declare a class 'employee' having data members name and age. Accept and display the data for three objects.
4	Write a program to show how static member is shared by multiple objects of the same class.
5	Develop a program to find out the mean value of a given number using friend function.
6	Develop a program to print student details of 'stud' class using constructor and destructor
7	Write a program to find prime number using default argument in constructor
8	Write a program to find out the payroll system using single level inheritance.
9	A. Write a program to find student details using multiple inheritance. B. Write a program to compute total marks of student using virtual base class.
10	Write a program to evaluate the largest number of an array using pointer
11	Write a program to search a character in a string using pointer.
12	Write a program to input and display code and price for two items using pointer to object.

13	Write a program to display roll_no and name of student using 'this' pointer.
14	Write a program to using function overloading to calculate volume of cube, cylinder & rectangular box
15	Write a program to overload unary '--' operator
16	Write a program to display the output using the virtual function.

Learning Resources:

    1. Books:

Sr. No.	Author	Title	Publisher
1	E Balagurusamy	Object oriented Programming with C++	Mc Graw Hill
2	Rajesh K. Shukla	Object oriented Programming in C++	Wiley India
3	B. M. Harwani	C++ for Beginners	SPD
4	Robert Lafore	Object Oriented Programming in C++ (4th edition)	Pearson

    2. CDs, PPTs Etc.:

        www.vikaspublishing.com/teachermanual.aspx (PPTs available)

        www.pearsoned.co.in/prc (After Registration resources are available)

    3. Websites:

        www.cplusplus.com

        www.learncpp.com

        www.sourcecodesworld.com

        www.softeam.com