PARUL UNIVERSITY - Faculty of Engineering and Technology

Department of Computer Science & Engineering

SYLLABUS FOR 5th Sem BTech PROGRAMME

Object Oriented Programming with C++ (203105331)

Type of Course: BTech

Prerequisite: Basic knowledge of object oriented programming language

Rationale: Object orientation is a new approach to understand the complexities of the real world. In contrast to the earlier approaches like procedural, object orientation helps to formulate the problems in a better way giving high reliability, adaptability and extensibility to the applications. The students are already familiar with the concept of programming in C which is the basic for C++. This course offers the modern programming language C++ that shall help the students to implement the various concept of object orientation practically. The students will be able to program in the object oriented technology with the usage of C++.

Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					Total
				External		Internal			
Lect Hrs/	Tut Hrs/	Lab Hrs/		T	P	T	CE	P	
3	0	0	3	60	-	20	20	-	100

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical

Contents:

Sr.	Topic	Weightage	Teaching Hrs.
1	**Introduction**: Procedure Oriented Programming, Object Oriented Programming, Purpose of object oriented Programming, Procedural Vs Object Oriented Programming, and Principles of object-oriented programming. Benefits and Applications of OOP.	7%	3
2	**C++ Basics**: Overview of C++, Program structure, namespace, identifiers, Data types in C++, variables, constants, operators, typecasting, control structures.	10%	4
3	**Functions in C++**: Basics of functions, Parameter Passing Mechanism, Inline function, Macro, Macro Vs Inline function, Function Overloading, Default Arguments.	8%	3
4	**Objects and Classes**: Object and Class in C++, Access Specifiers, Static data member and static member function, constructors and their types, destructors, friend function, operator overloading, type conversion	25%	8

5	**Inheritance:**: Concept of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical, hybrid, multipath, function overriding, virtual base class.	20%	7
6	**Polymorphism Virtual Functions and Templates**: Pointers in C++, Pointes and Objects, this pointer, virtual and pure virtual functions, Run time polymorphism, Templates- function templates and class templates.	20%	7
7	**I/O and File Management**: Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators, File stream, C++ File stream classes, File management functions, File modes	10%	4

***Continuous Evaluation:**

It consists of Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ) etc.

Reference Books:

1. Object Oriented Programming with C++ - 5th edition (TextBook)
   E. Balagurusamy; Tata McGraw Hill; Fifth Edition
2. The Complete Reference C++,
   by Herbert Schildt; TMH

Course Outcome:

After Learning the course the students shall be able to:

After learning the course the students shall be able to:
1. Develop confidence for self education and ability for life-long learning needed for Computer language.
2. Recognize features of object-oriented design such as encapsulation, polymorphism, inheritance, and composition of systems based on object identity.
3. Name and apply some common object-oriented design patterns and give examples of their use.
4. Design applications with an event-driven graphical user interface.

List of Practical:

1. **WAP to display basic details of a User like Name, Roll no, Division and Address.**
2. **WAP to Convert no. of Days into No. of Months and days.**
3. **WAP to convert temperature from Celsius to Fahrenheit**
4. **WAP to convert distance from C.M. into meter, KM. , feet, inches**
5. **WAP to find whether the no. is even or odd**
6. **WAP to find the largest among three numbers**
7. **WAP using switch case to perform basic arithmetic operations.**
8. **WAP to take input from user and calculate sum of its digit.**

9. **WAP which generates table of a given no.**

10. **WAP to calculates the sum and average of given no. using Do-While**

11. **WAP to swap two numbers using call by value.**

12. **WAP to swap two numbers using call by reference**

13. **WAP to swap two numbers using call by address.**

14. **WAP to calculate factorial of a no. using recursion**

15. **WAP to take input in an array and print it's sum.**