|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Program: Bachelor of Science Honours (Information Technology) | | | | | | | Semester: II | | | |
| Course: Object Oriented Programming | | | | | | | Code: | | | |
| Teaching Scheme | | | | | Evaluation Scheme | | | | | |
| Lecture | Practical | Tutorial | | Credits | Theory | | | | Practical | |
| Internal | External | | | Internal | External |
| 45 | Nil | Nil | | 03 | 40 | 60 | | | Nil | Nil |
|  | | | | | | | | | | |
| Internal Component | | | | | | | | | | |
| Class Test Duration Mins | | | Assignment& projects | | | | | Class Participation | | |
| 20 Marks | | | 20 Marks | | | | | Nil | | |
|  | | | | | | | | | | |
| Learning Objectives  1. To understand the concepts of object oriented programming.  2. Identify the difference of Object Oriented Programming with Procedure Oriented Programming,  3. To analyse the problem.  4. To design the logic fitting object oriented concept and implement the same in a programming language | | | | | | | | | | |
| Learning Outcomes  1. The learner will understand the concepts of Object Oriented Programming.  2. The learner will be able to identify the difference between procedure oriented programming language and object oriented programming language.  3. The learner will be able to analyse a given problem.  4. The learner will be able to design the logic on the basis of problem definition and implement the same in a programming language. | | | | | | | | | | |
| Pedagogy   * PPTs, Case studies, Group discussions, Classroom Activity, Videos, Research papers, News articles etc. | | | | | | | | | | |

Module 1 (09)

**Object Oriented Methodology:**

Introduction, Characteristics of Procedure Oriented Programming. Striking features of object oriented programming

Principles of OOPS: OOP Paradigm, Basic Concepts of OOPS: Objects, Classes, Data Abstraction and Data Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing

Benefits and Application of OOPS. Types of operators : Control Loops :for loop, if loop, if..else loop,While loop,do..while loop, switch.. case statement, conditional operator

Module 2 (09)

**Classes and Objects:** Simple classes (Class specification, class members accessing), Defining member functions,static data members, static member functions, passing object as an argument, Returning object from functions, friend functions.

**Constructors and Destructors:** Introduction, Default Constructor, Parameterized Constructor, copy constructor and examples, Destructors

Module 3 (09)

**Program development using Inheritance:** Introduction, understanding inheritance, Types of inheritance, Virtual Base class.

**Polymorphism:** Concept of function overloading, overloading operators, overloading unary operators ,overloading binary operators, Overloading unary and binary operators using friend function, rules for overloading operators

Module 4 (09)

**Exception Handling:** Introduction, Exception Handling Mechanism, Concept of throw & catch with example.

**Pointers, Virtual Functions and Polymorphism :**

Introduction to pointers, Pointer and Arrays, Array of pointers, Pointers to objects, Array of pointers to objects, this pointer, pointers to Derived objects,

**Virtual Functions & Abstract Classes:** Introduction to Virtual Functions, Rules for virtual functions, Pure Virtual Functions, Abstract classes, Basics of class templates and function templates

**References:**

1. Object Oriented Programming with C++ by E Balagurusamy 8th Edition Tata Mc GrawHill publication, September 2020.
2. Object Oriented Analysis and Design Timothy Budd TMH 3rd 2012
3. Mastering C++ K R Venugopal,Rajkumar Buyya, T Ravishankar Tata McGraw Hill 2ndEdition 2011