

Object Oriented Programming

<u>TEACHING SCHEME</u>	<u>EXAMINATION SCHEME</u>	<u>CREDIT SCHEME</u>
Lecture: 04 Hours/Week	End Semester Examination: 60 Marks	Theory: 04
Practical: 04 Hours/Week	Internal Assessment: 40 Marks	
	Term Work: 25 Marks	Practical: 02
	Practical :50 Marks	
	Total: 175 Marks	Total: 06

Course Objectives -:

It covers Object Oriented Concepts through Java Programming language and it also covers Multiprogramming and Exception Handling.

Prerequisite: C Programming

Course Outcomes: At the end of the course, the students should be able to:

1. To apply fundamental programming constructs.
2. To illustrate the concept of packages, classes and objects.
3. To elaborate the concept of strings, arrays and vectors.
4. To implement the concept of inheritance and interfaces.
5. To implement the concept of exception handling and multithreading.
6. To develop GUI based application.

Unit I: Introduction to Object Oriented Programming

08 Hours

OOP concepts: History and Features of Java, Difference between Procedural and Object-Oriented Programming, Objects, class, Encapsulation, Abstraction, Inheritance, Polymorphism, message passing, Java Virtual Machine, Basic programming constructs: variables, data types, operators, unsigned right shift operator, expressions, branching and looping.

Unit II: Class, Object, Packages and Input/output **08 Hours**

Class, object, data members, member functions Constructors, types, static members and functions Method overloading Packages in java, types, user defined packages Input and output functions in Java, Buffered reader class, scanner class

Unit III: Array, String and Vector **08 Hours**

Array, Strings, String Buffer and its Constructors, Vectors, Methods of the Vector Class, Constructor of Vector.

Unit IV: Inheritance and Polymorphism **08 Hours**

Use of Inheritance, Types of Inheritance in Java, Role of Constructors in inheritance, Polymorphism in OOP, Types of Polymorphism, static and dynamic polymorphism, Overriding Super Class Methods. Use of “super” keyword. Interfaces, Implementing interfaces.

Unit V: Exception handling and Multithreading **08 hours**

Exception handling using try, catch, finally, throw and throws, Multiple try and catch blocks, user defined exception Thread lifecycle, thread class methods, creating threads using extends and implements keyword.

Unit VI: GUI programming in JAVA **08 Hours**

Applet and applet life cycle, creating applets, graphics class functions, parameter passing to applet, Font and Color class. Event handling using event class AWT: working with windows, using AWT controls for GUI design Swing class in JAVA.

Textbooks

1. Herbert Schildt, ‘JAVA: The Complete Reference’, Ninth Edition, Oracle Press
2. E. Balagurusamy, ‘Programming with Java’, McGraw Hill Education.

Reference Books

1. Ivor Horton, “Beginning JAVA”, Wiley India.
2. Dietal and Dietal, “Java: How to Program”, 8th Edition, PHI .
3. “JAVA Programming”, Black Book, Dreamtech Press.
- 4 “Learn to Master Java programming”, Staredu solutions

List of Assignments (Course coordinator can design his/her own theory assignment. Following are samples of theory assignments.)

1. Explain the Object-Oriented Concepts in detail.
2. Illustrate the Constructor, Method Overloading. Explain use of Scanner Class.
3. Explain the Strings and Vector Class Methods with suitable example.
4. Define the Abstract Class and Abstract methods with suitable example.
5. Define Exception. Explain the Try, Catch and Finally keyword.
6. Explain Applet and AWT Package with its Classes.

List of Laboratory Exercises (Course coordinator can design his/her own practical assignment. Following are samples of practical assignments.)

1. Programs on Basic programming constructs like branching and looping
2. Program on accepting input through keyboard.
3. Programs on class and objects
4. Program on method and constructor overloading.
5. Program on Packages.
6. Program on 2D array, strings functions
7. Program on String Buffer and Vectors
8. Program on types of inheritance
9. Program on Multiple Inheritance
10. Program on abstract class and abstract methods.
11. Program using super and final keyword.
12. Program on Exception handling
13. Program on user defined exception
14. Program on Multithreading
15. Program on Graphics class
16. Program on applet class
17. Program to create GUI application
18. Mini Project based on the content of the syllabus (Group of 2-3 students)

Project Based Learning

1. Smart City Project
2. Currency Converter
3. Online Exam Project in Java

4. Moving Balls mini project using Java Applet
5. Text Editor in Java using AWT controls.
6. Album Manager Project in Java
7. Vehicle Management System in Java
8. Music Player project in Java
9. Student Management System Project in Java
10. Simple Calculator project in Java
11. Image to PDF Convertor in java
12. Simple Chat System
13. Online Quiz project
14. Pong game in java
15. Tokenize implementation.

(Note: - *Students in a group of 3 to 4 shall complete any one project from the above list)

Syllabus for Unit Tests:

Unit Test -1
Unit Test -2

Unit – I, Unit – II, Unit - III
Unit – IV, Unit – V, Unit - VI