

SEMESTER-III

COURSE 7: OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Theory

Credits: 3

3 hrs/week

Course Objectives:

- To make the students understand the fundamentals of Java programming.
- To expose the students to Window based applications using AWT
- To make the students to design appropriate Exception Handling in Java
- To make the students to understand the concepts of Threads Files and
- I/O Streams, Applets Networking in java.

Course Outcomes:

The student would become competent enough to write, debug, and document well-structured java applications

- Demonstrate good object-oriented programming skills in Java
- Able to describe recognize, apply, and implement selected design patterns in Java
- Understand the capabilities and limitations of Java
- Be familiar with common errors in Java and its associated libraries
- Develop excellent debugging skills

UNIT - I

Introduction to OOPS: Paradigms of Programming Languages – Basic concepts of Object Oriented Programming – Differences between Procedure Oriented Programming and Object Oriented programming - Benefits of OOPs – Application of OOPs. Java: History – Java features – Java Environment – JDK – API. Introduction to Java: Creating and Executing a Java program – Java Tokens- Java Virtual Machine (JVM) – Command Line Arguments –Comments in Java program. Elements: Constants – Variables – Data types - Scope of variables – Type casting – Operators: Special operators – Expressions – Evaluation of Expressions.

Case Study:

1. Study the evolution of JAVA, why it was developed, and how it changed the software industry scenario.

UNIT - II

Control Structures: The if Statement, Nested ifs, The if-else-if Ladder and, Looping Statements: The while Loop, The do-while Loop, for loop and its variations and Nested Loops. Jumping Statements: Break, continue Statement.

Class and objects: Defining a class – Methods – Creating objects – Accessing class members – Constructors – Parameterized Constructors, Adding a Constructor. Arrays: One Dimensional Array – Creating an array – Array processing – Multidimensional.

Case Study:

1. Study the difference between the looping structured in JAVA And Programming in C.
2. Study the limitation of Constructors in JAVA.

UNIT - III

Inheritance: Defining inheritance –types of inheritance– Method overloading – Static members – Nesting of Methods – this keyword - Overriding methods – Final variables and methods – Final classes – Final methods - Abstract methods and classes – Visibility Control.

Interfaces: Defining interface – Extending interface - Implementing Interface - Accessing interface variables. Strings: Constructing Strings, Operating on Strings, Arrays of Strings

Case Study:

1. Study the inheritance types available in JAVA and try to identify the limitations.

UNIT – IV

Packages: Java API Packages – Defining a Package, System Packages – Naming Conventions – Creating & Package Member Access – Adding Class to a Package.

Multithreading: Creating Threads – Life of a Thread – Defining & Running Thread – Thread Methods – Thread Priority – Synchronization –Implementing Runnable interface – Thread Scheduling.

Case Study:

1. Study the advantages of Package compared to Libraries in Procedural languages.

UNIT – V

Exception Handling: Limitations of Error handling – Advantages of Exception Handling - Types of Errors – Basics of Exception Handling - Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions

Applets: Introduction, Java applications versus Java Applets, Applet Life-cycle, Working with Applets, The HTML Applet Tag.

Case Study:

1. Study and present the limitation of Applets in Web application development.

TEXT BOOKS:

1. **Object Oriented Programming through Java**, Universities Press, by P. Radha Krishna.
2. E. Balagurusamy, “*Programming with Java*”, TataMc-Graw Hill, 5th Edition.

REFERENCES:

1. Herbert Schildt, “The complete reference Java”, TataMc-Graw Hill, 7th Edition.