II/IV B. TECH. FIRST SEMESTER

OBJECT ORIENTED PROGRAMMING THROUGH JAVA (Required)

Course Code : CS 3T5	**Credits: 3**
Lecture: 3 periods/ week	**Internal assessment: 30 Marks**
Tutorial: 1period/week	**Semester end examination: 70 Marks**

Prerequisites: C Programming

Course Objectives:

1. The main objective of this course is to understand the Object Oriented programming issues in developing more complex software designs. Students will also learn the advantages of Object Oriented programming over the normal and old paradigm structured programming languages. Examples which are demonstrated using java helps the students to understand the concepts and apply the features of Object Oriented programming. The enhancements that are made in the latest certification exams for java are also kept in view. This helps students to keep their skills up to date.

Course Outcomes:

At the end of this course student will:

CO1) Understand the key features of the Java programming language

CO2) Apply essential object-oriented programming concepts like dynamic polymorphism, abstract (virtual) methods using Java

CO3) Apply the principles behind good object-oriented design.

CO4) Get exposure to the latest trends in java language and its compatibility in handling numerous complex domains.

Syllabus:

UNIT 1

Java Basics and Anatomy:

Java Basics: OOP's principles, Java History, advantages, Data types, operators, expressions, control statements, methods and recursion, sample programs.

Java Anatomy: Java Objects and References, Constructors, this keyword, Arrays (single and multi-dimensional), String and its immutability, Buffer &Builder Classes, String Tokenizer

UNIT 2

Inheritance (Extending and Implementing): Introduction, Derived Classes, Advantages and Types of Inheritance, Implementation, Inheritance and Member Accessibility. Overriding, Super, Abstract classes and Methods, Final Classes and Final Methods, Dynamic Binding, Polymorphism.

Interfaces: differences between classes and interfaces, defining an interface, implementing interface, variables in interface, extending interfaces.

UNIT 3

Packaging and Java API

Packages: Defining, Creating and Accessing a Package, importing packages, access controls (public, protected, default, and private). Wrapper Classes and Auto Boxing, I/O classes

Collections Framework: Object class, importance of methods like hash code ( ) and equals ( ). Array List, application of Comparable and Comparator interfaces.

UNIT 4

Exception handling and Multithreading:

Concepts of exception handling, benefits of exception handling, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception. Threads: Thread life cycle, creating threads, synchronizing and Communication of threads.

UNIT 5

Graphical User Interaction

Graphical User Interaction: Swings- Introduction, limitations of AWT, components, containers, exploring swing-Frame and JComponent, Icons and Labels, text fields.

Layout managers– border, grid, flow. Event Handling: Events, Event Delegation Model, Event classes, Listeners, handling mouse and keyboard events.

Learning Resource

Text Books

1. Java Fundamentals, a Comprehensive Introduction, Herbert Schildt & Dale Skrien, 2013, McGraw-Hill.

References

1. Introduction to Java Programming 7/e, Brief version, Y.Daniel Liang, Pearson
2. Thinking in Java 4E: Bruce Eckel, Pearson
3. The Java™ Programming Language: Ken Arnold, James Gosling, Pearson.