2/4 B.Tech SECOND SEMESTER

IT4T1 **JAVA** **Credits: 4**
(Common to IT/ECM)

Lecture: 4 Periods/week **Internal assessment: 30 marks**
Tutorial: 1 Period /week **Semester end examination: 70 marks**

Objectives:

- The aim of the course is to introduce students with Core Java Concepts and to teach students the basic concepts of java programming.
- This course covers object oriented techniques related to the definition, creation and usage of classes, objects and methods.
- It enables us not to organize our program code into logical units called objects but also to take advantage of encapsulation, inheritance and polymorphism through problem analysis and how they relate to the design of methods, abstract classes and interfaces.
- This course also discusses the concepts of java API through programming and teaches students how to programme applets, swings in Java and networking.

Outcomes:

Students should be able to :

- Clearly explain the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
- Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
- Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifiers, automatic documentation through comments, error exception handling)
- Explain the justification for and the practical mechanisms behind basic Software Engineering practices such as code documentation of APIs, source code sharing
- Be able to write simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles.
- Be able to write computer programs to solve real world problems in Java

Syllabus:

UNIT I
GENESIS OF JAVA:
Creation of Java, Importance of java to Internet, Byte code, History of Java Java Features, Overview of Java.
JAVA BASICS:
Data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program.

UNIT II

CLASSES AND OBJECTS:

Concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT III

INHERITANCE:

Inheritance basics, Using super keyword, method overriding ,Dynamic method dispatch using final with inheritance, abstract classes.

UNIT IV

PACKAGES AND INTERFACES:

Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. **EXPLORING PACKAGES:** Java.io, Java.util

UNIT V

EXCEPTION HANDLING AND MULTITHREADING:

Exception handling Fundamentals, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, thread priorities, Inter thread Communication.

UNITVI

EVENT HANDLING:

Delegation event model, Events, Event sources, Event classes, Event Listeners, , handling mouse and keyboard events, Adapter classes, inner classes.The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels,scrollpane, dialogs, menubar, graphics, **LAYOUT MANAGERS** – layout manager types boarder, grid, flow, card and grid bag.

UNIT VII

APPLETS:

Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.

SWINGS:

Introduction, limitations of AWT, components, containers **EXPLORING SWINGS**-JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

UNIT VIII

NETWORKING:

Basics of network programming, addresses, socket programming, simple client server program, java.net package

Text book:

1. Java: the complete reference, 7th edition, Herbert schildt, TMH.

References books:

1. Programming in Java2 –Dr.K.Somasundaram.
2. Programming with Java ,A Primer-E.Balaguruswamy.
3. Java Programming Fundamentals – JimKeogh DreamTech Publications.
4. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, 7th Edition, Pearson Education.