# OBJECT ORIENTED PROGRAMMING THROUGH JAVA

**Course Code: 15CA3106** **L T P C**
**3 0 0 3**

**Course Outcomes:**

At the end of the course student will be able to

CO1: Define secure classes, objects & message passing to implement program.

CO2: Compare and contrast Inheritance and implement Packages for grouping classes.

CO3: Create Built-in-Exceptions to handle any type of Exception.

CO4: Write well structured & documented OO applications with event-driven Graphical User Interface (GUI).

CO5: Illustrate Swing components to develop GUIs for applications and applets.

**UNIT-I** (10 Lectures)

**Object oriented thinking** :- Need for oop paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of oop concepts, coping with complexity, abstraction mechanisms.

**Java Basics** History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling functions.

**UNIT-II** (10 Lectures)

**Inheritance** – Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits

of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

**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(Character streams, Byte streams), Files, (Directories, random access files), java.util (collections(vectors, hashmap, treemap, lists, sets,), calendar, regex(pattern matching), date, scanner).

**UNIT- III** (10 Lectures)

**Exception handling and multithreading** - Concepts of exception handling, benefits of exception handling, Termination or resumptive models, 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, daemon threads, thread groups.

**UNIT-IV** (10 Lectures)

**Event Handling:** Events, Event sources, Event classes, Event Listeners, Delegation event model, 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, menu bar, graphics, layout manager – layout manager types – boarder, grid, flow, card and grib bag.

**UNIT-V** (10 Lectures)

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

**Swing** – Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- 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.

**TEXT BOOKS:**

1. E.Balaguruswamy: "Programming with Java A Primer",4th edition, TataMcGraw-Hill, 2009.
2. Herbert Schildt: "Java The complete reference", 8th edition, McGrawHill, 2011.

**REFERENCES:**

1. Timothy budd, *"An introduction to object-oriented programming"*, 3rd edition, Pearson education, 2009.
2. Y. Daniel Liang, "*Introduction to Java programming"*, 9th edition, Pearson education, 2012.
3. Ivor Horton, "*Beginning Java"*, Java 7 edition, Wrox publications, 2011.
4. Cay. S.Horstmann and Gary Cornell, "*Core Java 2"*, Vol I, Fundamentals", 9thEdition, Pearson Education, 2012.
5. Cay.S.Horstmann and Gary Cornell, "*Core Java 2"*, Vol II, Fundamentals", 9thEdition, Pearson Education, 2012.

**Web references:**

1. http://www.onjava.com
2. http://developers.sun.com/rss/java.xml