OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(Common to CSE & IT)

Course Code: 22CT1104

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COURSE OUTCOMES: At the end of the Course the student shall be able to

CO1: Implement object orientated programming strategies and Contrast classes and objects.(L3).

CO2: Analyze Inheritance and Dynamic Method Dispatch (L4).

CO3: Demonstrate various classes in different packages and can design own packages (L3).

CO4: Manage Exceptions and Apply Threads (L6).

CO5: Create GUI screens along with event handling and write network programs (L6).

UNIT-I: (12 Lectures)

INTRODUCTION TO OBJECTS & CLASSES: What is Object Oriented Programming? Object Orientation as a New Paradigm: The Big Picture (TEXT BOOK-2), An Overview of Java: Process Oriented Vs Object Oriented Programming, OOP Principles, Java BuzzWords, The Byte Code, A First Simple Program.

Class Fundamentals with Variables and Methods, Declaring objects for accessing variables and methods. Data Types and Variables, Operators and Expressions, Control Statements, Type Conversion and casting, Lexical Issues in Java, Arrays: Single Dimension, command line arguments, Arrays: Multi Dimension.

Constructors: Default and Parameterized, this keyword and Garbage Collection, Final and Static Keywords, Overloading Methods, Overloading Constructors, Using objects as Parameters, Returning objects, String and String Buffer.

Learning Outcomes:

At the end of the module, students will be able to:

1. Summarize object-oriented programming features and Java features. (L2)
2. Explain classes, objects. (L3)
3. Use various data types and control statements in Java. (L2)
4. Explain about constructors and methods. (L3)

UNIT-II (08 Lectures)

INHERITANCE: Inheritance Basics, Types of Inheritance, Using Super keyword for constructors, Super to call variables and methods, Method Overriding, Dynamic Method Dispatch

Learning Outcomes:

At the end of the module, students will be able to:

1. Classify different kinds of inheritance. (L4)
2. Summarize the usage of super keyword in inheritance. (L2)
3. Explain Method overriding and dynamic method dispatch (L3)

UNIT-III (11 Lectures)

PACKAGES AND INTERFACES: Defining a Package, importing a package, Package Example, Access Protection, An Access Example, Abstract classes, Interfaces: Defining and Implementing Interfaces

EXPLORING java.lang: Wrapper classes, Object, Math, Runtime

EXPLORING java.util:The collection framework: ArrayList, HashSet and HashMap, StringTokenizer, Calendar, Random, Scanner

EXPLORING java.io: File class, Byte Streams, Character Streams, File Input Stream, FileOutputStream, FileReader and FileWriter classes

Learning Outcomes: At the end of the module, students will be able to:

1.Demonstrate the use of packages in Java. (L2)

2.Identify various built-in Java classes. (L2)

3.Apply various methods of Java built-in classes. (L3)

UNIT-IV (10 Lectures)

EXCEPTION HANDLING: Exception Handling Fundamentals, Exception Types, throw, throws and finally, Creating your own exceptions, Chained Exceptions.

MULTITHREADED PROGRAMMING: Java Thread Model, The Main thread, Two ways of Creating a Thread, Creating Multiple Threads, isAlive(),join(), Synchronization, Inter Thread Communication

Learning Outcomes:

At the end of the module, students will be able to:

1.Distinguish between error and exception. (L4)

2.Illustrate exception handling in Java. (L3)

3.Write Java multi-threaded programs. (L3)

UNIT-V (9 Lectures)

INTRODUCING GUI PROGRAMMING WITH SWINGS: Swing Features, MVC Connection, Components and Containers, Panes, Simple Swing Application, Simple Swing Applet, Layout Managers: Flow, Border, Card, Grid, Grid Bag, Working with Color, Working with Fonts, Painting in Swing, Exploring Swing Components

DELEGATION EVENT MODEL: Event Classes, Sources and Listeners.

EXPLORING JAVA.NET: Socket, ServerSocket, InetAddress, DataGramSocket, URL, Client-Server Program using Sockets.

Learning Outcomes:

At the end of the module, students will be able to:

1.Use swings to build GUI based applications (L3)

2.Design event driven based GUI applications. (L4)

3.Write network based Java applications (L4).

TEXT BOOKS:

1. Herbert Schildt, Java The complete reference, 11th Edition, McGrawHill, 2019
2. Timothy budd, An introduction to object-oriented programming, 3rd Edition, Pearson, 2009.

REFERENCE BOOKS:

1. Cay S. Horstmann, Core Java Volume I–Fundamentals, 11th Edition, Pearson 2019
2. Y. Daniel Liang Introduction to Java Programming Comprehensive Version, 10th Edition, Pearson, 2015.
3. Bruce Eckel, Thinking in Java, 4th Edition, Prentice Hall, 2006