OBJECT ORIENTED PROGRAMMING THROUGH JAVA

COURSE CODE: 20CA3108   **L T P C**

                                                3 0 0 3

COURSE OUTCOMES:
At the end of the course, student will be able to
CO1: Interpret object orientation and Utilize programming strategies
CO2: Contrast classes and objects and Analyze Inheritance
CO3: Design Packages, Manage Exceptions and Apply Threads
CO4: Produce GUI screens along with event handling
CO5: Identify various classes and methods in java. lang, util, i/o and net packages

UNIT-I: Introduction to Objects   **(10 Lectures)**
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, OOPs Principles, Java Buzz Words, The Byte Code, A First Simple Program
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.

Learning Outcomes:
At the end of the module, students will be able to
1. Summarize object oriented programming features. (L2)
2. Describe Java features. (L2)
3. Use various data types and control statements in Java. (L3)

UNIT-II: Introducing Classes   **(10 Lectures)**
Class Fundamentals with Variables and Methods, Declaring objects for accessing variables and methods, Constructors: Default and Parameterized, this key word and Garbage Collection, Final and Static Key words, Overloading Methods, Overloading Constructors, Using objects as Parameters, Returning objects, String and String Buffer
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. Explain classes, objects and constructors. (L2)
2. Write Java programs manipulating Strings. (L6)
3. Classify different kinds of inheritance. (L4)

UNIT-III: Packages and Interfaces   **(10 Lectures)**

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

Exception Handling:

Exception Handling Fundamentals, Exception Types, throw, throws and Finally Creating your own exception, 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. Demonstrate the use of packages in Java (L2)
2. Illustrate exception handling in Java (L3)
3. Write Java multi-threaded programs. (L6)

UNIT-IV: Introducing GUI Programming with Swings   **(10 Lectures)**

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.

Learning Outcomes:

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

1. Use swings to build GUI based applications (L3)
2. Describe various event classes and listeners (L2)
3. Design event driven based GUI applications. (L6)

UNIT-V: Exploring java.lang   **(10 Lectures)**

Wrapper classes, Object, Math, Runtime

Exploring java.util:

The collection frame work: ArrayList, HashSet and HashMap, String Tokenizer, Calender, Random, Scanner

Exploring java.io:

File class, Streams

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. Identify various built-in Java classes. (L2)
2. Apply various methods of Java built-in classes. (L3)
3. Write network based Java applications (L6).

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 Education, 2009.

REFERENCE BOOK:

1. Y. Daniel Liang, "*Introduction to Java Programming Comprehensive Version*", 10th Edition, Pearson, 2015.