Program : **Diploma in Computer Engineering / Computer Hardware Engineering**	
Course Code : **4131**	Course Title: **Object Oriented Programming**
Semester : **4**	Credits: **4**
Course Category: **Program Core**	
Periods per week: **4 (L:4 T:0 P:0)**	Periods per semester: **60**

Course Objectives:

- Understand object-oriented Principles.
- Write, Compile and Execute Java Programs.
- Familiarize GUI programming using Swing.
- Introduce database connectivity for developing applications.

Course Prerequisites:

Topic	Course code	Course name	Semester
Knowledge in Procedural programming language		Programming in C	III

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive level
CO1	Apply object-oriented programming paradigms to develop simple JAVA applications.	16	Applying
CO2	Build classes using inheritance, interfaces and packages	16	Applying
CO3	Build GUI applications using swing.	14	Applying
CO4	Develop applications using Database.	12	Applying
	Series Test	2	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3						
CO3	3						
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Apply object oriented programming paradigms to develop simple JAVA applications**		
M1.01	Explain the features of Object-Oriented Programming.	1	Understanding.
M1.02	Explain the JDK & IDE's for developing java applications	1	Understanding.
M1.03	Outline the general structure of a Java program and explain steps to create, compile and execute a program	1	Understanding.
M1.04	Describe objects and classes and use classes to model objects.	2	Understanding.
M1.05	Demonstrate how to define classes and create objects	1	Applying.
M1.06	Create Objects using constructors.	1	Applying
M1.07	Interpret accessing objects via object reference variables.	1	Understanding.
M1.08	Distinguish between instance and static variables and methods.	1	Understanding.
M1.09	Develop Java Programs to implement classes and objects.	2	Applying.
M1.10	Explain Visibility Modifiers and Data Encapsulation	1	Understanding.
M1.11	Develop methods with object arguments an differentiate between Primitive arguments and object type arguments	2	Applying
M1.12	Explain Exception Handling.	2	Understanding

Contnets:

Object Oriented Programming (OOP) – Characteristics of OOP – Features of JAVA – Advantages of JAVA – Tools Available of JAVA Programming (JDK, JAVA Packages, various IDEs like NetBeans, eclipse) – Building Java applications.

Objects and Classes – Defining a Class – Declaring attributes, Declaring and Defining methods, Creating Object – Accessing Objects - Constructors – Constructor overloading – Static variables, constants and methods – method overloading – Visibility modifiers, Data field Encapsulation, passing and returning objects as arguments, Array of objects-Exception handling, Try,catch,-Multiple catch & finally statement.

CO2	**Build classes using inheritance, interfaces and packages.**		
M2.01	Describe inheritance and different types of inheritance with examples.	3	Understanding
M2.02	Illustrate invoking the superclass constructor and methods using super keywords.	2	Applying
M2.03	Illustrate overriding instance methods in the subclass.	2	Applying
M2.04	Illustrate polymorphism and dynamic binding	2	Applying
M2.05	Explain visibility controls	1	Understanding
M2.06	Build abstract class, final class and method overriding	2	Applying
M2.07	Develop interfaces	2	Applying
M2.08	Develop packages	2	Applying
	Series Test I	1	

Contents:

Inheritance – Types of Inheritance – Superclass and subclass – calling super class constructor and methods – overloading vs overriding - Final variables, final methods and final classes – Abstract methods and class – polymorphism – dynamic binding – Visibility controls.

Interfaces – Definition – Extending, Implementing and accessing Interfaces- packages – Creating and Accessing of Packages.

CO3	**Build GUI applications using swing.**		
M3.01	Outline GUI Programming in Java using swing.	2	Understanding.
M3.02	Make use of packages containing GUI containers, components, event-handling classes and interfaces to develop simple applications.	2	Applying.
M3.03	Describe steps to create and manipulate GUI controls.	3	Understanding.

M3.04	Explain handling of mouse events and keyboard events.	2	Understanding.
M3.05	Explain Common GUI event type and Listener types.	2	Understanding.
M3.06	Develop programs using swing Components	3	Applying.
Contents: **Outline GUI programming** – Swing – Swing Components – Simple GUI based input/output programs - GUI application development using Swing components such as Jlabel, JtextField, Jbutton, Jlist, Jcheckbox, Jcombobox, Jpanel, Jtextarea – Event Handling – Common GUI event Types and Containers.			
CO4	**Develop applications using database**		
M4.01	Explain relational database & SQL	2	Understanding
M4.02	Explain SQL commands.	2	Understanding
M4.03	Illustrate the stages in JDBC	2	Understanding
M4.04	Illustrate the interfaces in JDBC –register the driver- connection- Preparedstatement- Executing statements- Resultset	2	Applying
M4.05	Develop simple application with database	4	Applying
	Series Test – II	1	
Contents: **Database** – Creation of databases-Tables -SQL commands like -create, alter, drop, select, insert, delete Database Connectivity – JDBC – RowSet interface – PreparedStatement - retrieving results - closing connection.			

Text / Reference

T/R	Book Title/Author
T1	Herbert Schildt, Dale Skrien: **Java Fundamentals A Comprehensive Introduction**
T2	Balaguruswamy E: **Programming with Java**, 6th edition.
R1	Liang, Y Daniel: **Introduction to JAVA Programming**, Pearson, 9th Ed.
R2	Herbert Schildt: **Java The Complete Reference**, Seventh Edition,
R3	Herbert Schildt: **Swing A Beginner's guide**
R4	Paul Deital, Harvey Deital: **Java How to Program**,
R5	Yang HU: **Easy Learning JDBC+Mysql**

Online Resources

Sl.No	Website Link
1	https://onlinecourses.nptel.ac.in/noc20_cs08/course
2	https://www.tutorialspoint.com/java