

SEMESTER IV

Course Code	Course name	L	T	P	C
CSEG1044	Object Oriented Programming	3	0	1	4
Total Units to be Covered: 6		Total Contact Hours: 75			
Prerequisite(s):	Programming in C - CSEG1041	Syllabus version: 1.0			

Course Objectives

1. Understand the need for OOPs and develop Java programs with object-oriented features.
2. Learn the concepts of JDBC and develop standalone application with GUI Panel.
3. Design & implement Java applications for real world scenarios.

Course Outcomes

- CO1.** Understand Object Oriented Programming concepts and architecture of Java.
- CO2.** Analyze and model the real-world entity using Java programming language.
- CO3.** Develop packages with Generics and Implement Interfaces with Exception handling.
- CO4.** Create Stand-alone Java applications using GUI swings and JDBC.

CO-PO Mapping

Program Outcome Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	1	-	-	-	-	-	-	-	-	-	-	-	2	3	-
CO 2	-	3	3	-	-	-	-	-	-	-	-	-	2	3	-
CO 3	-	3	3	-	-	-	-	-	-	-	-	-	2	3	-
CO 4	-	-	-	2	-	-	1	-	2	2	-	-	2	3	-
Average	1	3	3	2	-	-	1	-	2	2	-	-	2	3	-

1 – Weakly Mapped (Low)

2 – Moderately Mapped (Medium)

3 – Strongly Mapped (High)

“ - ” means there is no correlation

Syllabus

Unit I: Introduction to OOPs

5 Lecture Hours

Object Oriented Programming History and Evolution, Object Oriented Programming Principles, Features of Java, Input Output Statements, Comment Line Arguments, Data Types, Variables, Operators, Program Control Statements, Arrays, Type of Arrays, Strings. **(CO1)**

Unit II: Classes, Inheritance, Packages and Interfaces

8 Lecture Hours

Class Fundamentals, Objects, Constructors, Garbage Collection, this Keyword, Java's Access Modifiers, Method Overloading, static Keyword, Inheritance, Types of Inheritance, super to Access Superclass Members, Method Overriding, Abstract Classes, Using final, Packages and Interfaces, Build-in Interface, User defined Interfaces. **(CO1, CO2)**

Unit III: Nested Classes, Exceptions, Multithreading & IO Streams **8 Lecture Hours**

Nested Classes, Types of Nested Classes, Exception Handling, Exception Handlers, Concurrent Programming, The Thread Class and Runnable Interface, Thread Priorities, Synchronization, Java's I/O Streams, Byte Streams and Character Streams, FileWriter, FileReader. **(CO2, CO3)**

Unit IV: Generics, Lambdas, GUI Swing & Database Connectivity **8 Lecture Hours**

Generics Fundamentals, Generic Class, Generic Methods, Lambdas, Functional Interfaces, Swing, Components and Containers, Layout Managers, Swing Event Handling, Event Listeners, Event Classes and Listener Interfaces, Swing Controls, Database Connectivity, Statement, Prepared Statement, CallableStatement, Resultset. Persistent Data. **(CO3, CO4)**

Unit V: Collections and Wrapper Class**6 Lecture Hours**

Collections, Iteration, Collection Interface, Set and SortedSet, List, Map and SortedMap, Wrapped Collections and Collections Class, Wrapper classes and loading classes. (CO3)

Unit VI: Capstone Project**10 Lecture Hours**

Create Standalone Java Project, Designing of UML and database diagrams, GUI Panel development using swing, Establish connection with Database and Panel. Source Code Management and Collaboration using Git/GitHub. Unit Testing using JUnit, Integration Testing, Build and Artifactory Management. (CO4)

Total lecture Hours 45**References**

Textbooks	1. Herbert Schildt, <i>Java: A Beginner's Guide</i> , 10th Edition, McGraw-Hill Education, 2024. 2. Herbert Schildt, <i>Java: The Complete Reference</i> , 12th Edition, McGraw-Hill Education, 2024.
Reference books	1. Joshua Bloch, <i>Effective Java</i> , 3rd Edition, Addison-Wesley, 2018. 2. Allen B. Downey and Chris Mayfield, <i>Think Java: How to Think Like a Computer Scientist</i> , 2nd Edition, O'Reilly Media, 2020.
Web Resources	1. Oracle Java Documentation https://docs.oracle.com/javase/ 2. Java Tutorials by Oracle https://docs.oracle.com/javase/tutorial/
Journals	
MOOCs, online courses	1. Programming with Java – SWAYAM https://onlinecourses.swayam2.ac.in 2. Java Programming – NPTEL (IITs) https://nptel.ac.in/courses/106

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination etc.

Examination Scheme

Components	IA	MID SEM	End Sem	Total
Weightage (%)	50	20	30	100