DPG Institute of Technology and Management

Sector 34, Gurugram HR 122004

Lesson Plan

Course Name: Programming in JAVA

Faculty Name: Ms. Ayushi Dewan

No. of Lecture Hours/Week	**3**	**Exam Hours**	**3**
Total No. of Lecture Hours	**35**	**Exam Marks**	**75**
Course Code:	**PCC-CSE-309G**	**Semester**	**5**

COURSE OBJECTIVES:

1. Programming in the Java programming language.
2. Knowledge of object-oriented paradigm in the Java programming language.
3. The use of Java in a variety of technologies and on different platforms.

S. No	Topics to be covered	Teaching Methodology	Class Activity/Event	Remark /CO
SECTION A	**Unit 1**			
1	Evolution of Java and Object-Oriented Programming Structure	Chalk &Talk	Interactive discussion on evolution of programming languages	CO1
2	Overview and Characteristics of Java	PPT	Short quiz on Java features	CO1
3	Java Program Compilation and Execution Process	PPT	Flowchart preparation activity	CO1
4	Organization of the Java Virtual Machine (JVM)	Chalk &Talk	Diagram drawing of JVM components	CO1
5	Client-Side Programming and Platform Independence	Chalk &Talk	Case study	CO1
6	Relationship between JVM, JRE, and JDK	Chalk &Talk	Group discussion regarding difference among them	CO1
7	Introduction to JAR Format and Naming Conventions	PPT	Short Quiz	CO1

8	Data Types, Type Casting, and Operators	Chalk &Talk	Short Quiz regarding valid and invalid expression	CO2
9	Security Promises of the JVM and Security Architecture	Chalk &Talk	Brainstorming session on security features	CO1
10	Security Policy, Security Aspects, and Sandbox Model	PPT	Case study regarding sandbox	CO1
SECTION B	**Unit 2**			
11	Variables, Constructors, Anonymous Block, Method Overloading	PPT	Quiz on constructor types and overloading	CO2
12	Static Data Members, Block & Methods; Memory Structure	Chalk &Talk	Group discussion regarding static vs non static memory.	CO2
13	Class Loading & Execution Flow	Chalk &Talk	Case study regarding different flows	CO2
14	Argument Passing Mechanism and Wrapper Classes	Chalk &Talk	Quiz on call by value by wrapper class	CO2
15	This Keyword and Method Chaining	Chalk &Talk	Analysis of this keyword through lab	CO2
16	Inheritance, Code Reusability, and Object Class	Chalk &Talk	Concept mapping of inheritance hierarchy through group task	CO3
17	Inheritance & Runtime Polymorphism	Chalk &Talk	Discussion and demonstration using real-world example	CO3
18	Interfaces, Role-Based Inheritance, Aggregation & Composition	Chalk &Talk	Case study and team collaboration on interface relationships	CO3
SECTION C	**. Unit 3**			
19	Introduction to Threads and Thread Creation	Chalk &Talk	Quiz and team collaboration on thread lifecycle and thread states	CO2
20	Thread Synchronization and Communication	Chalk &Talk	Case study discussion on	CO3

			Producer–Consumer problem	
21	Introduction to Swing and AWT	Chalk &Talk	Team identification of GUI components (buttons, labels, frames)	CO3
22	Layout Managers and GUI Design	Chalk &Talk	Group chart comparing layout managers with examples	CO3
23	AWT Events and Event Handling Models	Chalk &Talk	Role play activity demonstrating event handling process	CO3
24	Packages and Scopes	Chalk &Talk	Quiz and concept chart preparation of access modifiers	CO2
25	Exception Handling in Java	Chalk &Talk	Quiz activity regarding checked and unchecked exceptions	CO2
26	Advanced Exception Handling and User-Defined Exceptions	Chalk &Talk	Conceptual demonstration and peer explanation	CO3
SECTION D	**Unit 4**			
27	Introduction to Collection Framework	Chalk &Talk	Quiz and team collaboration to list real-world examples of collections	CO3
28	Iterators and Maps in Collection Framework	Chalk &Talk	Group activity – comparison chart of Iterator, ListIterator, and Map	CO3
29	Hash and Tree-Based Collections	Chalk &Talk	Case study on HashMap vs TreeMap performance	CO3
30	Comparable, Comparator, and Thread Safety	Chalk &Talk	Team collaboration – role-based discussion on sorting and synchronization	CO3

31	Generics and Collection Algorithms	Chalk &Talk	Quiz and peer demonstration on use of generics in collections	CO3
32	Introduction to JDBC and Database Connectivity	Chalk &Talk	Group activity – drawing JDBC architecture flow diagram	CO3
33	Basic Database Operations and Prepared Statements	Chalk &Talk	Team collaboration – identify SQL queries for CRUD operations	CO3
34	Callable Statements and Advanced JDBC Operations	Chalk &Talk	Case study and peer discussion on stored procedures and transactions	CO3
35	Input/Output Streams and Reflection API	Chalk &Talk	Quiz and concept map creation on Java I/O streams and reflection	CO3

Assessment Methods: -

S.No.	Evaluation Component	Assessment Method	Marks
1	**Internal Marks**		**25**
		Attendance	**5**
2		**Quiz/Presentation**	**5**
3		**Assignment**	**5**
4		**Avg of Sessional 1&2**	**10**
5	**External Mar**	**Final University Exam**	**75**

Text Book Recommended:

1. Patrick Naughton and HerbertzSchidt, “Java-2 the complete Reference”, TMH
2. Sierra & bates, “Head First Java”, O’Reilly.

Reference Books Recommended:

1. Balaguruswamy, “Programming with Java”, TMH
2. Horstmann, “Computing Concepts with Java 2 Essentials”, John Wiley.
3. Decker &Hirshfield, “Programming.Java”, Vikas Publication.

Course Outcomes:

1. Knowledge of the structure and model of the Java programming language, (knowledge).
2. Use the Java programming language for various programming technologies (understanding)
3. Develop software in the Java programming language

At the end of the course, the student will be able:

CO 1	**Gain a solid understanding of the structure and design of the Java programming language** – Students will comprehend the core concepts, syntax, and architecture of Java.
CO 2	**Apply Java programming skills across various technologies** – Students will be able to use Java to develop different types of applications and solutions, ranging from web development to enterprise-level systems.
CO 3	**Develop software applications using the Java programming language** – Students will acquire the skills to design, build, and deploy functional software solutions in Java.