

23CS21P2 - OBJECT-ORIENTED PROGRAMMING THROUGH JAVA LAB

(Common to CSE, CSE (DS), CSE (AI&ML), AI&DS, and IT)

Course Category:	Professional Core	Credits:	1.5
Course Type:	Practical	Lecture-Tutorial-Practical:	0-0-3
Prerequisite:	Basic Programming Skills and Problem Solving Skills	Sessional Evaluation: Univ. Exam Evaluation: Total Marks:	30 70 100
Objectives:	<ul style="list-style-type: none">• To practice object-oriented programming in the Java programming language• To implement Classes, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism• To illustrate inheritance, Exception handling mechanism, JDBC connectivity• To construct Threads, Event Handling, implement packages, Java FX GUI		

Course Outcomes	Upon successful completion of the course, the students will be able to:	
	CO1	Demonstrate a solid understanding of Java syntax, including data types, control structures, methods, classes, objects, inheritance, polymorphism, and exception handling. (L2)
	CO2	Apply fundamental OOP principles such as encapsulation, inheritance, polymorphism, and abstraction to solve programming problems effectively. (L3)
	CO3	Familiar with commonly used Java libraries and APIs, including the Collections Framework, Java I/O, and other utility classes. (L2)
	CO4	Develop problem-solving skills and algorithmic thinking, applying OOP concepts to design efficient solutions to various programming challenges. (L3)
	CO5	Implement Keyboard and mouse event handling (L4)
Course Content	<p style="text-align: center;"><u>Sample Experiments</u></p> <p>Exercise – 1</p> <ol style="list-style-type: none"> Write a JAVA program to display default value of all primitive data type of JAVA Write a java program that display the roots of a quadratic equation $ax^2+bx=0$. Calculate the discriminate D and basing on value of D, describe the nature of root. <p>Exercise – 2</p> <ol style="list-style-type: none"> Write a JAVA program to search for an element in a given list of elements using binary search mechanism. Write a JAVA program to sort for an element in a given list of elements using bubble sort Write a JAVA program using StringBuffer to delete, remove character. <p>Exercise – 3</p> <ol style="list-style-type: none"> Write a JAVA program to implement class mechanism. Create a class, methods and invoke them inside main method. Write a Java program that demonstrates the use of access specifiers (public, protected, default, and private). 	

	<p>c) Write a JAVA program implement method overloading.</p> <p>d) Write a JAVA program to implement constructor.</p> <p>e) Write a JAVA program to implement constructor overloading.</p> <p>Exercise – 4</p> <p>a) Write a JAVA program to implement Single Inheritance</p> <p>b) Write a JAVA program to implement multi level Inheritance</p> <p>c) Write a JAVA program for abstract class to find areas of different shapes</p> <p>Exercise – 5</p> <p>a) Write a JAVA program give example for “super” keyword.</p> <p>b) Write a JAVA program to implement Interface. What kind of Inheritance can be achieved?</p> <p>c) Write a JAVA program that implements Runtime polymorphism</p> <p>Exercise – 6</p> <p>a) Write a JAVA program that describes exception handling mechanism</p> <p>b) Write a JAVA program Illustrating Multiple catch clauses</p> <ul style="list-style-type: none"> • Write a JAVA program for creation of Java Built-in Exceptions • Write a JAVA program for creation of User Defined Exception <p>Exercise – 7</p> <p>a) Write a JAVA program that creates threads by extending Thread class. First thread display “Good Morning “every 1 sec, the second thread displays “Hello “every 2 seconds and the third display “Welcome” every 3 seconds, (Repeat the same by implementing Runnable)</p> <p>b) Write a program illustrating is Alive and join ()</p> <p>c) Write a Program illustrating Daemon Threads.</p> <p>d) Write a JAVA program Producer Consumer Problem</p> <p>Exercise – 8</p> <p>a) Write a JAVA program that import and use the user defined packages.</p> <p>b) Without writing any code, build a GUI that display text in label and image in an ImageView (use JavaFX)</p> <p>c) Build a Tip Calculator app using several JavaFX components and learn how to respond to user interactions with the GUI</p>
Text Books & References Books	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford. 2. Joy with JAVA, Fundamentals of Object Oriented Programming, Debasis Samanta, Monalisa Sarma, Cambridge, 2023. 3. JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson. <p>REFERENCE BOOKS:</p> <ol style="list-style-type: none"> 1. The complete Reference Java, 11th edition, Herbert Schildt,TMH 2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson
E-Resources	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses/106/105/106105191 2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012880464547618816347_shared/overview